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AVIATION

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THE GENERAL *Mailplane*

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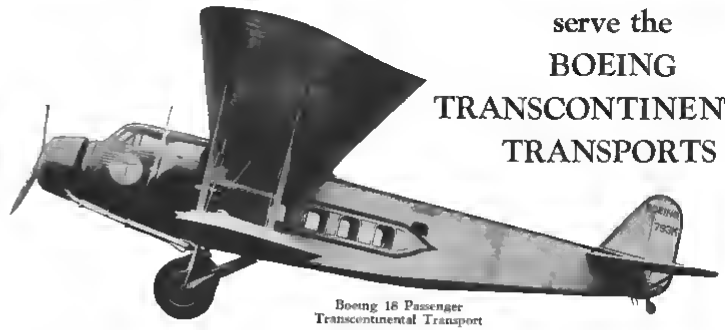

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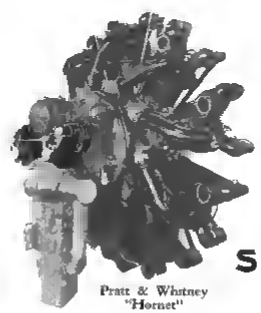

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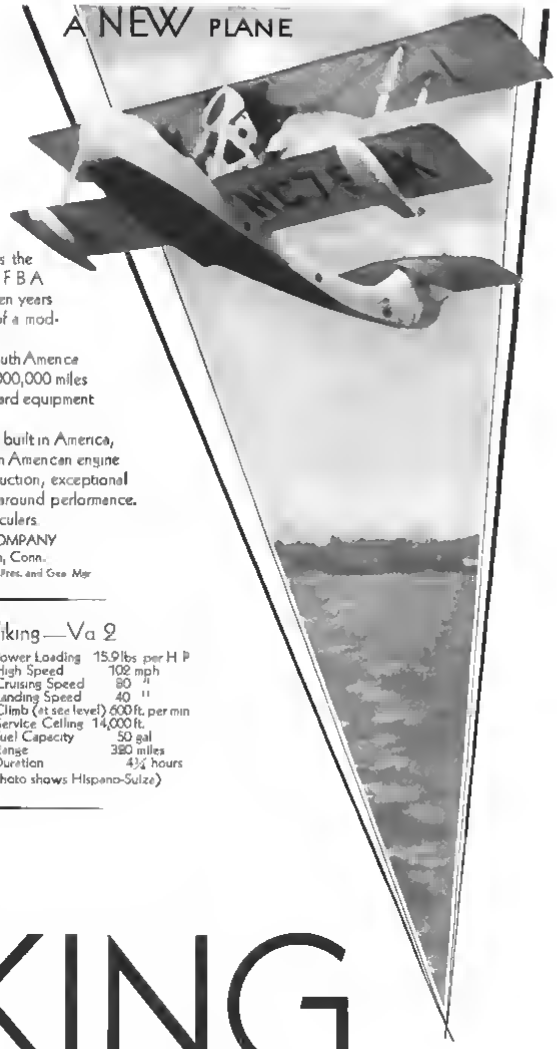

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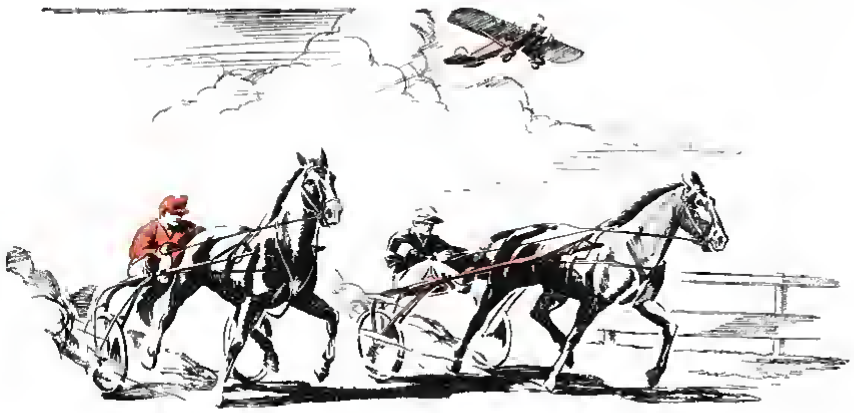

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Fuel Capacity	130 gallons
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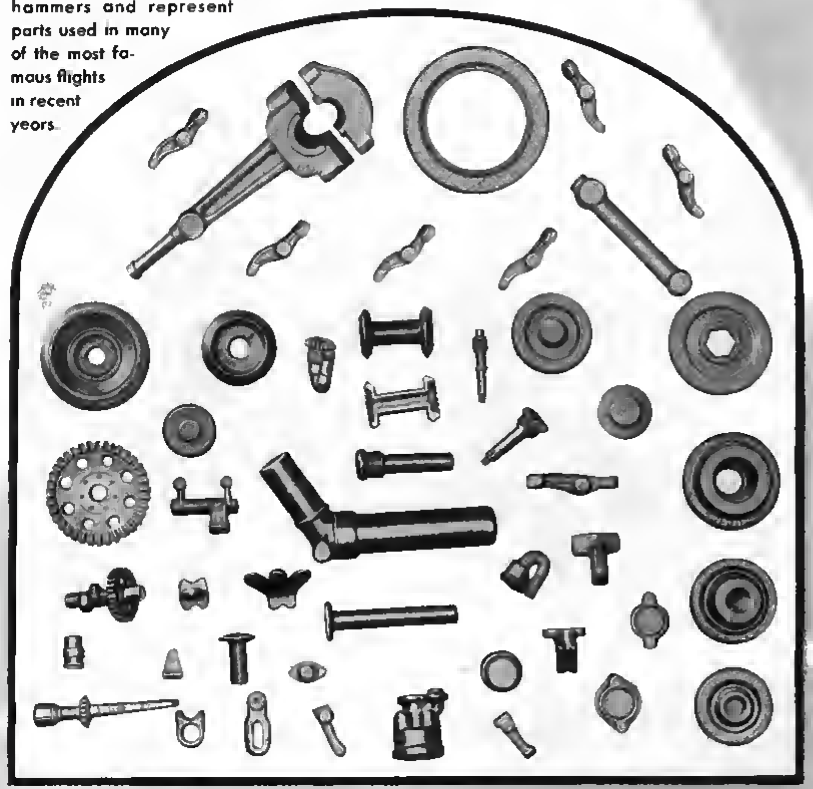

MUCH of the success of distance flights depends on the capacity of light steel parts to resist fatigue. The standardization and increased reliability of airplanes today, as compared with those that fought the war, is due to a considerable extent to the improvement in steel quality.

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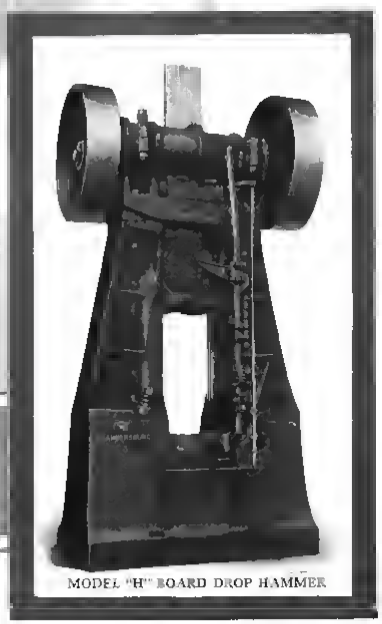

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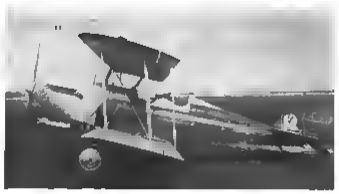

On the left is shown the American Eagle A-129 three - place open cockpit Biplane, powered with the OX5 Engine

On the right is shown the model A-129 powered with the Kinner K 5 motor.

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AVIATION

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AVIATION

THE OLDEST AMERICAN AERONAUTICAL MAGAZINE

A McGRAW-HILL PUBLICATION ESTABLISHED 1916

EDWARD P. WARNER *Editor*

VOLUME 27 . . . *October 26, 1929* . . . NUMBER 17

The Scylla and Charybdis of Government Regulation

FOUR YEARS AGO the airplane industry was taking in Washington a unique stand. Congress had been long accustomed to high-powered propaganda aimed at the cancellation of regulatory legislation or the escaping of its effects upon commerce. Seldom if ever before had the accredited representatives of great manufacturing interests come before the committees of House and Senate and implored the government to take them in hand and put restrictions upon their activities.

In 1925 there was too little regulation, and the industry sought more. In 1929 there begin to be alarming signs that too much may be imposed, and the industry prepares to struggle against that peril as it had once to struggle against the disastrous results of complete laissez-faire.

The Interstate Commerce Commission was created to supervise the railroads. The airlines, say the enthusiasts for regulation, are commercial and they are interstate. Why not turn them over to the Commission? Senator Bratton of New Mexico proposes to act upon the inspiration. There lies in the Senate a resolution introduced by him a month ago calling for an exhaustive investigation of airplane accidents by a Senate committee, with the final object of determining "the feasibility or advisability of placing those engaged in interstate air commerce under the supervision of the Interstate Commerce Commission, and if so, the kind and amount of legislation needed to accomplish that result." Vigorously opposed by Senator Bingham, the Senate's only qualified pilot, and debated to the extent of seven pages of the Congressional Record, the resolution was finally returned to the calendar without action. It will come up again, and others like it will be introduced repeatedly. The industry must be prepared to meet the situation.

The subject of economic regulation, and especially of rate control, is too large to be treated in so general an editorial as this. We shall turn to discuss it again, and no doubt repeatedly, in the future. Concerning one proposed change in regulation, however, the issue is clear enough to be disposed of at once. Upon any suggestion of taking the present technical functions of the Aeronautics Branch, and turning them over to the Interstate Commerce Commission, we look with an abhorrence which we are sure the industry as a whole will share. The Commission's functions are primarily economic and legal. It has no organization for controlling the airworthiness of aircraft. Equally clearly, there is no occasion for a Senatorial inquiry into so technical a matter. It would labor under an even greater handicap than did the Senate committee investigating the causes of submarine sinkings, and would accomplish exactly the same results—to wit, nothing. Aeronautical interests should present a united front in opposition to any such suggestion. Upon that ground alone, the Bratton resolution should not pass.

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Effort Sadly Misdirected

WORLD'S and national records are the finest sort of publicity for aviation, or for any manufacturer of airplanes and power plants—provided that they are the right sort of records. Record figures which bear some relation to practical conditions of operation testify to the qualities of the equipment with which they are made and to the quality of the design and research that stand behind the other products of the same firms. Records which are mere stunts of physical endurance or of unreasonable chance-taking ought to have no advertising value among intelligent people. They have no more to do with the progress of aviation than the late unlamented championship long-distance gabfest had to do with the art of oratory.

The greatest offender against common sense is the solo endurance record. Airplane duration records are of the utmost importance, and we should like to see some Americans make serious attacks upon the present German mark, but the endurance of the airplane has now

outpaced anything that a single individual can hope to attain With a record already standing at sixty-five hours a two-man crew is absolutely essential to any serious attempt to raise it The first plane and engine to fly without stop and without refueling for three full days and nights will deserve and receive world-wide applause To have flown a shorter time with the pilot alone in the plane is, for the airplane, no achievement whatever It demonstrates nothing except some individual's ability to stay awake, by the use of drugs or otherwise, for an abnormal length of time at a rather monotonous task The performance is one exactly on a level with the dance marathons which have served in recent months to give depressing evidence of the number of slack-witted humans abroad in the land

This may seem strong language Strong language is called for. Solo endurance trials have already caused at least one death and they are sure to cause more if continued Not only do they furnish no test as to the qualities of the airplane but the worst airplane actually has the best chance The danger that the pilot faces is not fatigue from overwork, but the irresistible sleepiness of monotony It is far easier to stay awake for thirty-six hours or more in a machine that requires constant and varied action on the controls than in one so stable that the pilot has only to sit in his seat and watch it go

Responsible bodies, such as the National Aeronautic Association, ought in the future to list attempts at stunt records of this sort for proscription along with plane-changing and delayed-opening parachute competitions. Responsible people seriously concerned with further development of aviation will have nothing to do with them. If publicity be withheld from the records of no value or those positively harmful, and if public applause for their makers be discouraged, there will be more effort to spare in directions where it can be of some use both to the aircraft industry and to aeronautical science

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Coming From the U.S.S.R.

THE UNITED STATES has a new group of aerial visitors They are unique in two respects They are the first who have ever entered the United States from Asia by heavier-than-air craft They are the first who have ever come to us by air from Russia

The crossing of the Behring Strait, and the flight through the Aleutian chain and Alaska, is a large undertaking at any time of year, and no matter how much preliminary organization may have been provided To start off so short a time before winter makes itself felt, and with practically no organization of any kind, bespeaks the implicit confidence of the crew both in their airplane's quality and in their own. In this case after sundry preliminary mishaps and delays the confidence proved itself justified when the expedition arrived on more hospitable soil That last phrase can carry a double meaning Not only is the climate of the continental United States much more friendly to aviators of every nationality than is that of the far northern Pacific but the social climate is much less chill than it would have been for Russian visitors a few years ago. Without wishing to revive any unpleasant memory, it is worth recalling that when the Army's round-the-world fliers were forced to make a descent at Komandorski five years ago they were given very short shrift by the local commandant, and orders came from Moscow to compel them to be on their way immediately The greatness of the change since that time is sufficiently shown in the warmth of the welcome given to Messrs Shestakov, Bolotov, Sterlingof, and Fufaev on their arrival at Seattle, a reception that will be duplicated elsewhere in this country, and in the very good treatment received by the Ford plane now touring Europe when it included Moscow in its itinerary Aviation, which is the greatest foe of isolation of spirit, has had its share in producing the change. The whole world applauded without distinction of nationality while the Krassin and the Russian airplane pilots were waging their Homeric struggle to save the airship Italia's crew

No one should take exception to the new state of affairs The economic philosophy upon which the Soviet state is built, and the views of Nicolai Lenin which are there held sacred, happen to be abhorrent to most Americans, but that has nothing to do with the case Neither has the fact that our government has found it impracticable to enter into diplomatic relations with the powers at Moscow All that matters to us is that the officers and crew of the Russian-built plane "Land of the Soviets" are brave and skillful men. We shall examine their machine with interest as the original product of a national aircraft industry of the development of which we have known too little. We applaud their flight. We are sincere in our expression of hope that they will have only pleasant recollections of their visit to the western hemisphere

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Forestalling the Used Plane Problem

THE PRACTICE of trading in used planes on new plane purchases is rapidly mounting. As the production of aircraft overtakes the demand it will become necessary more and more often to take a used plane in trade before selling a new plane. Distributors in the Southern California territory report that it is even now necessary to take in a used plane in fully half of the new plane transactions, whereas a year ago these same dealers were selling nine out of ten airplanes without hearing anything about a used machine. At this rate

it is evident that in a very short while a new plane sale without making a used plane allowance will be a very rare thing The result is that stocks of used planes are, rapidly mounting and the problems of used plane appraisal, trade-in allowance, re-conditioning, re-inspection by Federal authorities and final resale are becoming serious

If the aviation industry is to avoid the trade-in problem which has become such a source of anxiety in the automotive world immediate attention must be given to this situation If used planes are to be properly re-conditioned we must have more uniform shop practices Factory branches at strategic points, or strong distributor organizations where factory methods are in vogue, will help to bolster the buyer's confidence in a used plane purchase The situation plays into the hands of the merger groups, for it forecasts a day when the small and lonely factory without powerful alliances will be unable to compete with the larger organizations which can render more complete service This will result in a stronger aviation industry, and one in which "orphan" airplanes will be a rarity, because the surviving aircraft builders will be those who can stay in the game year after year, following the career of each individual airplane produced by that factory, and giving each airplane the service which will keep it in the air.

Of course the questions of when a used plane has been properly reconditioned, and when it has reached the end of its useful life, rest directly in the hands of the Department of Commerce, Aeronautics Branch. As other states follow the lead of the twenty that have already acted and rule all aircraft out of the sky unless licensed by Federal authority, the Department's burden will grow heavier It is to be hoped that Congress will provide funds for the proper expansion of the inspection branch, so its work may continue to be intelligently and comprehensively done.

Most important of all phases of the used plane problem is the need of the dealer to keep trade-in allowances low enough to leave an ample margin for the proper reconditioning of the used airplane and its resale at a price low enough to attract a buyer and high enough to insure against loss to the dealer. Dealers who grant unwise allowances on old machines in order to make new plane sales are not being fair to themselves the manufacturer of either the new or used plane or the industry Such a course can only result in glutted used plane markets and stagnation within the industry

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Horsepower Versus Man Power

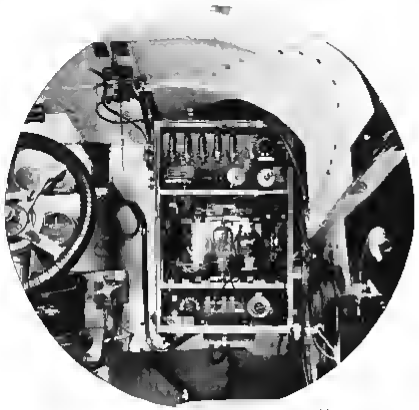
THE ACHILLES HEEL of the airship has always been maneuverability on the ground From the first days of the first Zeppelin the most anxious moments have occurred in getting the ships out of their hangars and in again Even after a technique had been developed to the point where manhandling no longer constituted a serious hazard of operation, it continued to impose a very substantial economic barrier to putting the ships into any regular service

Trials of a mobile mooring mast made at Lakehurst within the past couple of weeks, have more potential bearing upon the future commercial employment of rigid airships than anything else that has happened since the British first introduced the high mast. The flights of the Los Angeles and the Graf Zeppelin have done much to speed the day of commercial employment, but there is nothing in the performance of those ships of the feasibility of which any competent authority was previously in doubt That airships can be constructed to fly for ten thousand miles without stop, pass through very severe weather, and to make speeds of eighty miles an hour or better has been assured for a long time. There has been no assurance that they could be handled at their terminals with reasonable promptitude and at reasonable cost

The high mooring mast was the first key to the dilemma of ground handling, and offered the first hope of obviating the necessity of calling out the standing army to drag the ship into the hangar after a landing. The mobile mast just tried at Lakehurst, after many months of delay in its construction, is the second step in the same direction although for another purpose The mooring mast offers assurance of temporary lodging The mobile mast makes it possible to get into the hangar and out with a minimum ground crew The two supplement each other, for although the mooring mast is often sufficient it cannot be a sole reliance. The hangar must be available as a resort in case of damage to the ship or in severe storms, and it must be possible to take shelter therein without delay A mobile mast, moving firmly along a track and dragging the airship after it by the nose, both simplifies the process of docking and makes it possible to carry it out when it could not have been done at all by manual effort

This experiment developed by Commander Rosendahl and his associates for purely naval purposes, removes one of the principal factors which might have justified timid capital in keeping away from commercial airship operations in the past. In accordance with the trend of the times, specialized machinery finds another opportunity of replacing human labor. Sociology may sometimes look with alarm upon the advance of the machine and its so-called supremacy over the man, but we may be sure that none of the enlisted men at Lakehurst, who have been turned out of bed at all hours of the night to drag the Los Angeles into harbor, or who have stood by ready for action throughout nights when the ship did not come at all, will join in deploring the introduction of a mechanical device to relieve them of the greater part of that task

AIR ROUTE Radio Services IN GREAT BRITAIN



Showing the installation of a Marconi 150 watt set aboard an Imperial Airways transport

By C. B. CARR
Late of the British Air Ministry Signals Staff

Radio has come into its own in American air transport only very recently. It has been a regular adjunct to passenger services in Europe for a considerably longer time. Now that the importance of proper and continuous communications is universally recognized, European radio experience has a special interest for American operators. Mr. Carr describes it from a British point of view. The rental of radio equipment from the manufacturing company and the making of payment for its use on a basis of actual performance is especially interesting.

TO GIVE a comprehensive and accurate description of the radio services operating in Great Britain for commercial air route purposes is a task of some magnitude, owing to the complexity of the subject. Because of the fact that so much of the air route work with which Great Britain is concerned is of an international character, no excuse is necessary for beginning such an article with a brief description of the international aspect of air route radio services, as conducted in Europe, before describing in greater detail the radio services and organization at present operative in Great Britain—particularly since the latter are, to a great extent, regulated by international agreement.

Many European countries are relatively small in size, are comparatively densely populated, possess highly developed networks of railway services, and, in addition, suffer from weather conditions which are changeable in character and which, naturally, make the regular operation of air services a task of great difficulty. The resulting tendency in the development of European air routes is for the services to be operated over distances of some length, and hence to become international rather than national in character. The task of organizing air routes is accordingly one which, in comparison with a similar task in a country of the size of the United States, bristles with administrative difficulties. Even a comparatively short air route may traverse three or more countries and hence require the cooperation of a similar number of entirely separate national administrations in order to ensure a smoothly-running organization for the route as a whole.

Of all the aspects of international air route organization, that of the radio services is probably the most truly international, since unfortunately—from many points of view—radio transmissions, once started, take no heed of national or other boundaries. Hence the closest international collaboration is required, in order both to prevent the services of one country from seriously interfering with those of its neighbors, and to permit the development of a common and what has now become an extremely complex radio organization.

Luckily this fact was realized early in the development of air route organization in Europe; in 1919, representatives of many European and extra-European countries met in conference in order to draw up regulations which should be the basis of all air route operations in the countries concerned. The result of this conference

A general view of the transmission building, at the Croydon Aerodrome wireless station

was the formation of the International Convention of Air Navigation, which was almost immediately ratified by all nations who were party to the Conference, and which has, up to the present been ratified by some 27 nations. The work of extending the scope of, and amending from time to time the original Convention, in order to keep abreast of the rapidly growing complexity of air route organization, is entrusted to a permanent commission, The International Commission of Air Navigation, which has its headquarters in Paris, and which meets at least once a year for this purpose at various European capitals in turn. Among other matters (such as air route and airport rules, meteorological, medical matters, etc.) this Commission deals, by means of a technical sub-commission with the regulation of air route radio services.

REGULATIONS adopted by the International Commission of Air Navigation are necessarily wide in their conception and their application. In order, therefore, to provide a means for dealing with the more detailed aspects of air route organization, recourse is necessary to smaller and less formal international conferences, or, where suitable international channels do not already exist, to direct collaboration between the countries concerned. The most important minor international gathering of this nature is undoubtedly the International Air Traffic Conference, which meets twice a year, and which is attended by representatives of the governments of Great Britain, France, Belgium Holland, Switzerland, Germany, Czechoslovakia and the Sarre Territory. The work carried out by this conference in regard to the provision of an adequate international radio organization for commercial air routes cannot be overestimated, since without such close collaboration on the part of the countries in question, the development of such an organization would have been impossible.

Ground radio stations in Great Britain for air route purposes are, as in other countries forming party to the International Convention of Air Navigation, provided and operated by the government. No charge is made for their use by any aircraft, whatever its nationality, which communicates with them, with the sole proviso that all communications must be confined to messages affecting the safety of the aircraft or the regularity of the air services. Although this proviso is purposely capable of a wide interpretation, it is not, in practice, abused, since the interpretation lies, on the one side, in the hands of responsible government employed ground station personnel and, on the other, in the hands of the pilots or operators on board the aircraft. Both of the latter hold government-granted licenses to operate radio apparatus in the air, and are accordingly liable to having their licences suspended or even withdrawn in the event of repeated infringements of the regulations.

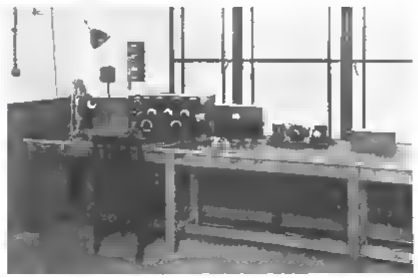
Aircraft registered in Great Britain and flying for hire or reward, if capable of carrying ten or more persons, including the crew (according to their Certificates of Airworthiness), are compulsorily fitted with wireless apparatus; the regulations concerning this matter purposely omit to state whether radio telephonic or radio telegraphic apparatus is to be fitted, since this is a matter entirely dependent on the conditions obtaining on any particular air route such as the seating capacity of the aircraft employed, the type of country over which the route passes, the distance apart of the route ground radio stations, the weather conditions normally to be expected along the route, etc. If radiotelephony is employed as the means of communication, the pilot himself acts as operator, and holds a certificate and license to this effect; if, however, radiotelegraphy is employed, a fully certificated and licensed operator is carried on board the aircraft for this purpose. In British aircraft, as in the case of the majority of European countries, the former state of affairs obtains on account of the necessity for reducing the pay-load by as small an amount as possible; in other cases, however, notably in the case of German aircraft a separate radio operator is carried on board, and radiotelegraphy employed as the means of communications.

British ground stations for air route radio purposes are accordingly capable of dealing with both types since, in addition to the services operated by Imperial Airways, Ltd., French, Belgium, Dutch and German services

operate daily to and from the London airport at Croydon Croydon is the terminal in Great Britain for international air routes, and the British government has recently installed at this airport, to replace the original radio station which was erected in 1920, one of the most up-to-date and efficient air route radio stations in the world In addition, a lower-powered relaying station is installed at Lympne airport (near the English coast of the Channel) and a third station, the duties of which are solely confined to direction-finding work at Pulham in Norfolk. These three stations provide all necessary radio services in connection with commercial air routes operating in Great Britain, and their functions can be conveniently classified under three main headings (1) communicating with the aircraft themselves (the aircraft service), (2) inter-airport communications (the "route traffic" service), (3) meteorological communications

The aircraft service is carried out on a normal wavelenght of 900 meters, both for radiotelephonic and for radiotelegraphic communications, and comprises both the normal communications service to and from aircraft and the direction-finding service. In addition, in order to relieve the congestion which is already being felt on the 900-meter wave (owing to the large number of radio fitted aircraft which are in the air simultaneously, in a relatively small area) an alternative wave of 900 meters is provided for radiotelephonic communications, and one of 870 meters for radiotelegraphic communications

Under the heading of "normal communications" fall the usual messages sent to and from aircraft operating along a typical air route Ordinarily there is a first call on leaving the aerodrome of departure, in which the registration markings of the aircraft (which, incidentally, form its call sign) and the airport of destination are given, and by means of which the transmission wavelength of the aircraft is corrected if necessary. Then there are several messages reporting the progress of the aircraft along the air route, sent from pre-arranged points; requests for weather conditions ahead of the aircraft, if, as is often the case, these have changed materially since the departure, and a final message to the airport of destination stating that the last recognized position-reporting point along the route has been passed, and that the aerial is being wound in and the aircraft radio station is closing down In addition, special messages may be sent, such as requests from the pilot for instructions from the operating company's airport manager, requests from the pilot for assistance in case of trouble, messages from the ground authorities to a pilot, warning him that other aircraft are in his vicinity, during conditions of fog or low clouds, and so on. In this connection it may be of interest to note that in Europe the country is divided into areas for radio and ground control purposes the delimitations of these areas are agreed internationally, and each area has allotted to it an airport ground station responsible for communications



Reception apparatus in the Croydon Administration Building

with all aircraft up to the limits of the area For example, an aircraft flying within area "A" will communicate solely with area "A" ground stations On passing from area "A" to area "B" it reports this fact to both area 'A" and area "B' ground stations, whereupon the latter takes over responsibility for communications It has been proved in practice that this system is both logical in conception and simple to operate It has the great advantage that control of aircraft is systematic, and obviates the possibility of communications being carried out between aircraft and distant ground stations—communications which, on account of the necessity for frequent repetitions owing to weak signals, cause great disturbance to other aircraft working

The aircraft direction-finding service, which is also operated on the 900 meter wave, is provided by a network of ground direction-finding stations By means of

The newly constructed Administration Building at Croydon, showing the radio aerials

this service, the pilot of an aircraft can be given, on request, either the true bearing of his aircraft relative to a particular direction-finding station, or the magnetic bearing of the direction-finding station relative to his aircraft or the actual position of his aircraft at a given time. Position finding is, of course, achieved by the collaboration of two or more direction-finding stations, each of which obtains a simultaneous bearing on the aircraft The recognized air routes are divided into sectors for this purpose, the delimitations of which are, as in the case of the communications areas, agreed internationally Each sector has allotted to it one direction-finding station as control station, and one or more collaborating stations in the case of the British sector of the Continental routes (between Croydon and the Continental coast of the Channel), Croydon is the control station, with Lympne and Pulham as collaborating stations.

Interior view of the transmission building showing four 4 kw Marconi airport ground transmitters

The sequence of operations, in the case of a pilot flying within this sector and requiring to be given his position, would be as follows the pilot calls Croydon (since all requests for positions must always be made to the sector control station in question) and asks for his position; Croydon acknowledges and requests for thirty seconds of transmission (in case of radiotelephonic communications, carrier-wave transmission is employed for this purpose), during this period of transmission Croydon, Lympne and Pulham each take simultaneous bearing on the aircraft; immediately the transmission ends, Lympne and Pulham each pass their respective bearings, by radiotelephony, to Croydon, and receive, in return the bearing observed by Croydon Croydon then lays off the three bearings on a special chart, during which time Lympne and Pulham do likewise on identical charts (as a check against possible error at Croydon), and finally Croydon informs the pilot of the aircraft that at such and such a time he was so many miles in such a direction from such and such an internationally recognized point This would appear, to those unacquainted with the service, to be lengthy process, but actually the complete sequence of operations is carried out in far less time than it takes to write these words In fact, the average time taken under the conditions described between the first request on the part of the pilot and the reporting of the position by Croydon is from a minute and a quarter to a minute and a half.

When it is added that it is usual to give a pilot the position of his aircraft correct to within a mile or so, the outstanding importance of the direction-finding service becomes apparent, both from the point of view of the safety of the aircraft and its passengers and of the increased regularity of the services which becomes possible: numberless cases could be quoted in which pilots have safely brought their aircraft through fog, sometimes without having been able to see the ground once in two hundred miles of flight solely as a result of the navigational assistance afforded by this service

An additional service, with which the pilot of an aircraft does not come into such direct contact, but which, nevertheless, is of vital importance to the regular operation of air services, is the inter-airport, or "route traffic", radiotelegraphic service, which is operated on a wave length of 1380 meters, with an alternative wave of 1210 meters. This service (which is international in character, since all communications between aerodromes in Great Britain are carried out by means of private telephone lines rented from the Postal Administrations by the Air Authorities) is used solely for the purpose of exchanging "service" messages between the Government authorities at the various airports: for example, immediately an aircraft leaves Croydon for, say, Paris, a departure message is sent from Croydon wireless station station to the wireless station for Paris (Le Bourget), in which is given the registration marking of the aircraft, the name of the pilot, the time of departure, the number of passengers, and details of the freight carried Similarly, immediately an aircraft lands at Croydon, an arrival message is despatched by wireless to the last aerodrome of departure of the aircraft, in which is given the registration marking and time of arrival of the aircraft In addition to the exchange of these routine arrival and departure messages, the inter-airport service is utilized for notifications to neighboring stations of obstructions to a particular airport, such as floods, snow, etc, for notifying last-minute changes in service (delays, etc.), and, in general, for sending, any messages necessary to ensure the smooth-running and regularity of the air services. This service, like the aircraft radio service, is operated free of charge by the government, and is subject to the same proviso as regards the types of messages which may be accepted. In order to reduce the volume of traffic handled daily by this service, it has been found necessary to prepare an international code for abbreviating messages.

Still another service, with which the pilot of an aircraft rarely comes into contact, is that provided for the radiotelegraphic broadcasting, at regular intervals during the day, of meteorological information covering areas

served by the routes This service, which operates on the wave length of 1260 meters in Great Britain, and on wave lengths of 1288 and 1316 meters elsewhere in Europe, is the nerve center of an exceedingly complex international meteorological organization, whereby the meteorological staffs at airports are enabled to prepare their weather charts, etc., at frequent intervals, usually every half hour or so, and to make their air route forecasts The necessity for the utmost punctuality and regularity in the exchange of meteorological information is obvious, and the importance of this last radio service to the successful operation of commercial air routes cannot be over-stressed

The station at Croydon is worthy of special note It comprises a receiver group, which is situated on the flying field, and a transmitter group, which is situated at Mitcham Common at a distance of slightly under three miles from the airport. Each receiver controls, by means of a buried cable joining the two groups, one or more transmitters The receiver group consists of a direction-finding receiver for the aircraft service, operating on a wave-length of 900 meters which is installed in the Control Tower, and a second receiver, for the inter-airport service, which is non-directional, and is installed in a room in the Administrative Buildings It operates on a wave-length of 1380 or 1210 metres

The transmission group comprises four 4-kw telegraph-telephone transmitters installed in a building which was specially designed for their accommodation These transmitters are identical in characteristics, each being capable of transmitting continuous and interrupted continuous wave telegraphy, as well as radiotelephony, on any wave-length between 800 and 2000 meters In addition, each transmitter is provided with an "independent drive" system of control in order to ensure the constancy of transmission frequency. At present, two of these transmitters are employed to furnish the aircraft radiotelephone and aircraft radiotelegraph service respectively, a third is employed to furnish the inter-airport radiotelegraph service, and a fourth is kept as a "stand-by," being capable of assuming the duties of any of the other three in the event of trouble The meteorological service is at present carried out by the British Air Ministry Wireless Station, but it is possible that in the near future this service also will be operated from the Croydon station The equipment for both the transmitting and receiving group was designed and supplied by the Marconi Company of Great Britain and has given complete satisfaction in every respect since its installation some eighteen months ago

THE TYPE OF EQUIPMENT standardized for use in British commercial aircraft is the Marconi type AD6h 150-watt "Universal" aircraft telegraph-telephone set The transmitter and the five valve rereiver are enclosed in a common instrument case. The transmitter can operate on any wave-length between 300 and 1500 meters when installed in a large passenger-carrying aircraft, and the receiver on any wave length between 200 and 1800 meters under similar conditions. The remainder of the equipment forming the complete installation comprises a wind-driven generator (provided with an automatically variable pitch windmill), which supplies both anode and filament power to transmitter and receiver valves; a six-volt accumulator battery which "floats" across the low-tension output of the generator; an automatic type of aerial winch, a trailing aerial 200 ft long; the fairlead, through with the aerial wire passes on its way between the aerial winch and the exterior of the fuselage; a head set, consisting of a pair of telephone receivers and a microphone with a special helmet containing fittings to take the telephone receivers; and the necessary cables. If an operator is carried and radiotelegraphy employed as the means of communication, a telegraph unit is supplied, together with additional equipment for providing telephonic inter-communication between pilot and operator. The instrument case is arranged for remote control by means of Bowden cables from the pilot's (or operator's) seat, in order to simplify installations The Marconi Company keeps a staff of skilled engineers at Croydon whose whole-time duties consist of inspection and maintenance of the aircraft wireless equipment The same type of set is used on Belgian, Dutch and Swiss planes

The weight of the complete equipment as described above is slightly under 100 lb, and the maximum two-way radiotelephony range from Croydon airport radio station is 250 miles; the radiotelegraphy range from Croydon under the same conditions is on the order of 400 miles

THE CONTRACT between Imperial Airways and the Marconi Company is drawn up on the basis of "payment by results", flights which are successful, from a radio point of view, are paid for according to mileage flown, and any flight on which radio communications are unsatisfactory or completely unsuccessful fails to rank for payment Since the monthly assessment of successful mileage is carried out jointly by the two Companies (cases of doubt being settled by reference to data supplied by the Croydon wireless station log-book) it follows that this system not only provides the fairest basis of payment as between the Companies in question, but also serves as a means of obtaining interesting and thoroughly reliable data as to the efficiency of the British aircraft radio services During the year 1928 the figure for successful as compared with unsuccessful radio communication during flights averaged 97 per cent, and the total aircraft mileage during this period was approximately 782,000 miles This stage of efficiency has been reached in only nine years of operation

In conclusion, a few data concerning the work carried out by Croydon wireless station may be of interest. During the week ending Aug 1, 1929, for example a typical summer week so far as air services are concerned —radiotelephony communications were carried out with aircraft employed in the operation of 296 separate air services, and radiotelegraphy communications with aircraft employed in the operation of 13 air services. In addition, 78 weather reports were sent to aircraft. Owing to the fact that no record is kept of the total number of messages passed between Croydon radio station and aircraft, and vice versa, an accurate figure in this respect cannot be given On the assumption, however, that each air service operated involves the sending of at least five messages from the aircraft to Croydon, and neglecting messages originating from the ground, it will be seen that more than 1500 messages are sent weekly in the aircraft radio service

During the same period the inter-airport service handled 835 "out" messages, totalling 11,273 words and 722 "in" messages, totalling 6,243 words—figures which demonstrate most clearly that this service is of almost equal importance to that of the aircraft radio service in the regular operation of commercial air routes

THE GENERAL Mailplane

By LESLIE E. NEVILLE
Technical Editor of AVIATION

THE MODEL 107 MAILPLANE developed by the General Airplanes Corp, Buffalo, N Y., is soon to be manufactured on a quantity basis Flight tests are now being conducted and production tooling installed at the factory Credit for the design is due A Francis Arcier, Vice-President, in charge of operations of the company and Roscoe I Markey, project engineer for the mailplane. The plane was designed to meet the requirements of commercial air mail operators as indicated by responses to a number of questionnaires distributed by the manufacturer

The Model 107 is a sesquiplane having an open cockpit in the rear portion of the fuselage while the mail compartment occupies the entire forward portion By a few simple changes in the mail compartment construction the plane can be converted into a six-passenger transport. The power plant includes a Pratt & Whitney geared Hornet engine rated 525 hp at 1,900 r p m

Aluminum alloy is employed throughout the construction of the fuselage which is of the monocoque type Wood is used only in the wing beams which are box type built of spruce. The wings and tail group members have fabric covering The Model 107 has a span of 50 ft, an overall length of 35 ft and an overall height of 11 ft 11 in. The weight of the first plane empty including 140 lb of special electrical equipment was 3,380 lb. and the gross weight 6,800 lb, giving a useful load-gross weight ratio of 0 52 by disregarding the weight of special equipment

The high value of this ratio is attributable in a large degree to the precise distribution of material in the structure In general, overall dimensions of structural members have been made as large as possible within the limitations set by the danger of failure by crinkling This characteristic is noted not only in the fuselage and wing beams but it is also to be observed in many of the tubular members in various parts of the structure In practically every possible case, large diameter thin walled tubes are used rather than members having comparatively smaller diameter and thicker walls A thorough stress analysis verified by static tests has contributed in obtaining a rigid structure throughout

Full advantage has been taken of the streamlining possibilities furnished by this almost elliptical fuselage cross-section which lends itself readily to the installation of cowling of the N A C A type The aerodynamic efficiency has been further increased by fairing of sharp corners such as the intersection of lower wings and tail surfaces with the fuselage In the case of the adjustable stabilizer, the cuffs or fillets are so designed that they move with the stabilizer The wing and chassis struts are fitted with removeable filleted cuffs

In order to provide the necessary engine-propeller efficiency for a fuselage of so large a section, the geared engine was selected This permits use of a large diameter slow speed propeller which is desirable where the fuselage section is large.

The maximum depth of the mail compartment is 60 in and the maximum width, 56 in One hundred and seventy-five cu ft. of cargo space is provided An effort is made to reduce the width of the fuselage at the cockpit and at the same time have sufficient width at the tail to provide a rigid installation for empennage members

THE FUSELAGE CONSTRUCTION of the first plane is an adaptation of the methods developed by the Hall Aluminum Aircraft Corporation, also of Buffalo It is planned, however, to make certain modifications in the production model In the first plane, the material

A rear quarter view of the General Mailplane showing the diminutive lower wing and well streamline fuselage

throughout was Aluminum Company of America designation 17ST sheet stock. Alclad will be used on future production models

The structure consists of three solid disk bulkheads and 15 ring type frames The frames were built by the Hall company and consist essentially of angle members capped with flanged tubes Two types of stringers are used, and both are standard Hall drawn sections, i.e., a bulk angle and a flanged U-section At the maximum section there are 34 stringers which provide ample support for the skin and prevent breathing of the shell Skin is attached in 12-in strips and riveted Although the contour of the fuselage is gracefully formed, there are no bumped sections in the skin

Several modifications of the method of fabrication are to be made in the production model The frames are to be built in halves, split on a vertical line, making it possible to attach stringers to the skin while it is in the flat form thereby greatly simplifying the riveting operation The skin in the production model will be applied in 24-in strips instead of 12-in strips as was necessary in the construction of the first airplane Skin and frame are both reinforced by gusset plate as required Joints are treated in assembly to prevent corrosion

The skin thickness, which is determined on the basis of static tests is carefully proportioned to meet the Department of Commerce requirements at the same time working at as high unit stress as possible

The fire wall is reinforced by double diagonal stiffeners of flanged U-section A casting of special design is placed at each of the four corners at the ends of the U-section members This provides four points of suspension for the engine mount The casting is designed to accommodate double rubber washers between its cone-shaped members, the whole being tied together by a through bolt, to which the engine mounting members are attached This special joint is effective in eliminating the engine vibration passing into the fuselage

There are two doors in the fuselage one on the top center at the front end of the baggage compartment and the other on the left side at the rear The top center door in the first plane is 23 in in diameter and will be increased to 25 in long by 26 in wide with approximately a five-inch radius in the corners The rear door is now 22 in high by 34 in wide and will be increased to 34 in wide by 46 in high with a 5-in radius in the corners This door will be placed in the right side of the baggage compartment instead of on the left If the plane is converted into a six-passenger transport, eleven round windows, 12 in in diameter will be added and the side door also will be fitted with a window The door in the top would then be modified to serve as an emergency exit

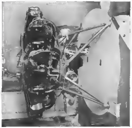
THE WINGS have washed out tips which are characteristic of other General Airplanes Corporation designs The washed out incidence is intended to reduce tip losses and decrease the tendency to yaw. The lower wing is tapered in section only, with the characteristic tips The tapered lower wing, washed out tip and small dihedral are employed to obtain a high degree of lateral stability An airfoil section of medium thickness, designated G A C 500, is employed.

Lower wing stubs are built up of two beams of heat-treated chrome molybdenum steel, attached to the fuselage by bolting to aluminum alloy castings riveted to the fuselage structure Rigidity of the bolted joints is maintained by tapered bushings These tapered bushings are used also at several other points in the construction At points of highest stress, where fittings are attached to the fuselage, steel rivets or bolts are used in place of aluminum alloy rivets This is true not only of the lower wing stubs, but of the engine mounting, cabane strut fittings and tail wheel mounting The beams are braced to the fuselage internally by steel tubes, and externally by streamline wires The external bracing was not required by the analysis but was employed to increase the rigidity of the structure The stubs have ribs built up of metal angles, and braced by a Warren truss Double streamline wires are used in the plane of the lift struts to increase the rigidity of the cellule

The wing structure is built up of spruce beams with aluminum alloy ribs The form ribs are constructed of flanged tube section material braced with a Warren truss and riveted together, while the compression members are aluminum alloy round tubes with transverse wire bracing in the plane of the tubes Compression members and wire bracing are double The double tubes form a complete compression member, tied together at the ends with aluminum alloy channels, to which steel lugs are riveted for the wires. These rivets also hold in place a cone plug which mates with a female plug in the end of the tube, keeping it in position and allowing for any eccentricity between beams

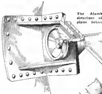
The channels are attached to beams with eye bolts having heads so placed that they are used for fastening the transverse brace wires in the plane of the compression rib By this means, it is possible to install or remove compression ribs without interfering with the form ribs Plywood covering is placed in the lower surface of the first bay where the gasoline tanks are mounted

Each form rib is attached to the wooden beams by eight aluminum alloy angles, and 16 wood screws Static tests showed that this method eliminates any possibility of failure at this point Wing beams are of equal length and a T-section end rib built up of spruce provides a stiff and durable tip Internal bracing ex-

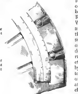


The engine mount construction of the Mailplane

The Aluminum alloy structure of the first plane before covering



Above—Sketch showing engine mount attachment casting



Right—Construction of transverse frames and attachment of skin and stringers

tends to the tip Steel and aluminum alloy have been used in construction of wing fittings according to the advantages of both, considering serviceability and weight Wing fittings of the cabane are of steel, while the strut fittings are of aluminum alloy

Ailerons have full leading edge balance and differential action the upward travel being approximately twice that in the downward direction A slot built into the wing just ahead of the aileron varies in size with the change in position of the aileron, the purpose being to increase the stalling angle. In construction the ailerons are similar to the elevator and rudder which will be described in detail later

Each aileron is mounted on five tubular cantilever members of aluminum alloy, which are bolted directly to the wing beams The bolts used for this purpose are the same as those that hold the transverse wing bracing Care has been taken to avoid crushing of the beam under the legs of the mounts by using large washer blocks of ash adjacent to the beam, and large steel washers under the legs of the mount Ailerons are prevented from shifting endwise by adjustable screws set in each end of the aileron on the hinge axis The heads of these screws fit against the reinforcing plates in the adjacent rib on the wing

THE EMPENNAGE is mounted on self-aligning ball bearings to prevent looseness that might result from elongation of bolt holes The elevator and stabilizer are built in two halves and the connections are made with steel fittings bolted together with bolts having the special wedge bushings The stabilizer and fin have rectangular aluminum alloy beams, aluminum alloy ribs and leading edge

An inverted double cambered airfoil section is used for the stabilizer. The section being deep, permits use of rugged beams of large overall dimensions The front beam is attached to the rear by a set of gusset plates Ribs are built up of flanged tubing in the form of a Warren truss, and the end rib is reinforced with bulb angle material This type of construction is also used in the vertical fin The elevator and rudder are somewhat similar in construction the ribs being identical to those of the fixed surfaces while the beams are chrome molybdenum steel tubes with welded lugs to which the ribs are riveted Beams in the movable surfaces are large diameter thin walled tubes. The elevator halves are joined by a tube carrying a double mast, the tube being attached to each elevator by a pair of bolts and wedged bushings of the usual type providing a tight fit The masts are attached to collars, which are in turn riveted to the beam eliminating the necessity of welding directly to the beams of the elevator and rudder As in the case of the ailerons the movable surfaces are all leading edge balanced throughout the full span of the surfaces Tail surfaces and ailerons were static tested with loads 25 per cent greater than design requirements, without a single failure, and with unusually small deflection The tail surfaces were designed to I C A N requirements which, for this design, were 55 lb per sq ft Vertical surfaces were designed to the same loading as the horizontal surfares

STANDARD 36-in by 8-in or 40-in by 10-in Bendix wheels and brakes are employed for the landing gear which is of the divided axle type, built up of tripod tubes Main axle tubes and bracing tubes are hinged to the fuselage at the location of the double frames and connected to high strength steel castings carrying the axle stub Both ends of the shock strut and both pivot struts are fitted with replaceable bushings, the metals being bronze to steel The tubes are of heat-treated chrome molybdenum steel with aluminum alloy sheet fairing clamped to the struts

An unusual feature of the shock absorber strut is a combination of rubber and oil units operating in series.

The compression rubbers have molded streamline section and are built up in cellular form The oil piston is fitted with a stuffing box and the plunger has a release valve to permit quick recovery of the hydraulic strut Care is taken to prevent oil from coming in contact with the compression rubber by installing a wick oiler for the guide bushings in the compression rubber unit This oiler can be quickly and easily refreshed in service by removing a filleted cuff attached to the lower wing at the top of the strut In landing, a total vertical deflection of ten inches is provided for the wheels, and five inches while taxiing This shock absorber unit is the result of a long series of experiments, and rubber was selected to be used in connection with the oleo unit to eliminate any positive and abrupt limit to the deflection, in order to avoid shock loads on the structure

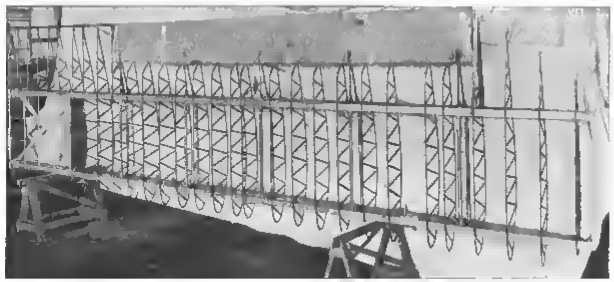
Another interesting feature of the landing gear is the self-oiling tail wheel The wheel is mounted on a heat-treated chrome molybdenum steel tube fork in such a way as to permit 360 deg castor action The fork is carried in a steel tube socket pivoted to the fuselage on a horizontal axis and mounted on large diameter bearings fitted with replaceable bushings The tubular housing contains a unique cam mechanism which centers the wheel The fork is bronze to steel bushed and is provided with an Alemite connection for lubrication The internal cam is constructed on the upper end of the fork tube, which acts downward against a vertically sliding mating cam and coil spring Any departure of the tail wheel from normal position causes the cam to compress the spring, while the reverse action of the spring against the cam keeps the wheel centered when the plane is moving straight forward

The tail wheel was constructed in co-operation with the Westinghouse Electric & Manufacturing Company, and the Goodrich Tire & Rubber Company The wheel is built of Micarta and is hollow and of full streamline form with a replaceable solid rubber tread The wheel is fitted with a bronze bushing bearing on a replaceable steel sleeve bolted in the fork by an aluminum alloy bolt A supply of lubricating oil is carried in the hollow portion of the wheel and holes are provided in the bushing for the lubricant to reach the steel sleeve As the wheel turns a portion of the oil supply is carried upward and falls on the bushing, providing continual lubrication at that point

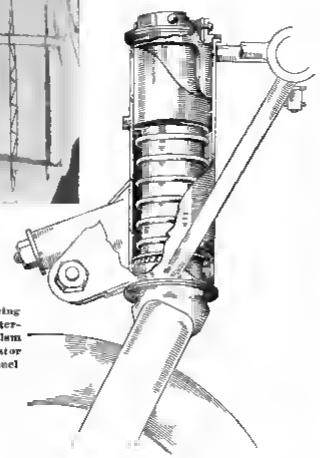
The tail wheel shock absorber strut is also oil and rubber, but unlike that of the landing gear, the oil and rubber act in parallel rather than in series The shock absorber strut is full universal joint mounted with cross bolts and the packing gland is adjustable A total vertical deflection of 9½ in is provided An emergency skid, built of a U section material and filled with hard wood is provided at the tail to furnish a means for a jacking base

THE STABILIZER ADJUSTING MECHANISM is operated by a torque shaft from the cockpit fitted with thermoid disk universal joints The shaft actuates a steel worm and bronze gear mounted in aluminum alloy cast housing, which is dust and waterproof Provision is made for adjustment of the worm gear for wear The gear is mounted in self-aligning ball bearings bolted to cast aluminum alloy fittings riveted to the skin These fittings are kept in alignment by a tranverse tube rigidly attached to each fitting The linkage to the stabilizer is an independent unit mounted on ball bearings and attached to lugs on the front beam of the stabilizer and is so designed that it takes transverse as well as vertical loads It consists of a transverse tube the center line of which travels through an arc of about 170 deg. The tube carries a double-link connection bolted to the stabilizer beam This connection works on the toggle principle, giving greatest controlling power at the ends of travel when the stabilizer is subjected to the highest loading

Self aligning bearings are employed in the control system wherever it is desirable to reduce friction which may occur under load Bearings in the control system are packed with grease and kept weatherproof by felt washers and metal retainers Castings are used wherever necessary to provide mounting for ball bearings in the control system, and special attention has been paid to their design in order to reduce deflection



Left—The uncovered wing structure showing metal ribs and wood spars.



Right—Showing the self-centering mechanism of the castor type tail wheel

The control stick is built up of two channels, and has a very wide base It is light in weight and carries its load with a minimum of deflection. The connection of control stick to torque tube is ball bearing mounted

The aileron control consists of a cast aluminum alloy bell crank, mounted on double ball bearings used to maintain alignment and reduce friction These bearings are mounted to a tripod of steel tubes bolted to the wing beams The bell crank, which is actuated by cables is attached to the aileron by an adjustable connecting link resembling a turnbuckle

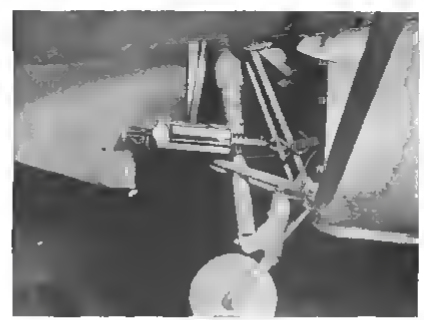
Engine controls consist of push pull rods guided by fiber tubes, attached with ball and socket joints to ball bearing mounted bell cranks Aluminum alloy levers mounted on a large diameter stainless steel tube are used for centering the bearings The levers slide between bakelite plates and friction may be adjusted by the pilot at any time by turning a large diameter knurled nut on the face of the control.

Special attention was devoted to the design of the instrument board, which is ¼ in aluminum alloy sheet and attached to one of the transverse frames by a shock-proof rubber inset mounting The board is divided into three sections, of which the center is easily removed Flight instruments requiring occasional adjustment are mounted on this section The right division carries pressure gages and fuel control units, and by this means all of the pipe lines are kept on the right side of the airplane Controls for the electric system with all switches grouped in one bank, are placed on the left portion of the board Flight instruments except the Motometer Ice Warning Indicator, were furnished by the Pioneer Company An electric clock, manufactured by the Sterling Clock Co , also is included as standard equipment Another feature of the instrument equipment is an electric tachometer

Of special interest is a switch of new design, manufactured by the Bryant Electric Co This switch has a carrying capacity of 35 amperes, and is mounted in a convenient light weight Bakelite case. Several Pyle National switches for work requiring lower carrying capacity also are used The flight instruments are so placed that in level flight the pointers are in horizontal position In a climb there is a general movement upward of the pointers, and in a dive the pointers move downward Two card retainers are located in a convenient position on the board, one intended to accommodate the compass correction card, while the other is for blank cards on which the pilot may make notations while in flight In the lower right-hand corner is a plate giving the major dimensions and weight of the plane, and also having space for the number and model, as well as the number of the approved type certificate

The pilot's seat is adjustable through a range of 10 in in vertical travel, a horizontal range of 4 in and an angular range of 6 deg The seat frame may be released quickly from the structure The seat may be swung forward from the top, giving access to the rear portion of the fuselage and uncovering the door of the pilot's locker This compartment, which has a capacity of 3 cu ft , is located in the fuselage behind the seat Brake and rudder pedals are ball bearing mounted, and the brake is applied by an auxiliary stirrup hinged to the rudder pedals at such a point that the movement of the stirrup applying brake is not hindered by the angular movement of the pilot's ankle

An adjustable windshield is provided, having nonshatterable glass in the front, celluloid cozy wings reinforced with flanged tubes on the edges on the side The windshield is set in rubber, and rubber washers are used to provide friction for the adjustment



The tail wheel mounting and shock absorber.

THE NACA COWLING which is well adapted to the design because of the fuselage section, is so constructed that it can be removed in sections and each section can be removed without disturbing the others An electric inertia starter and booster coil, which are controlled by a single button are provided Pushing the button winds the inertia starter and pulling it engages the starter and automatically applies the booster An engine-driven generator of 25 ampere rating and a 12-volt, 13-plate 65-ampere-hour storage battery with the necessary indicating instruments, constitute the electric system

Consideration of service details and an attempt to provide complete one-man equipment, is characteristic of this design Cleeks are provided on the axle for a jack Towing cables are furnished as regular equipment The front wing struts are fitted with lugs to which tie-down cables can be attached and three corkscrew stakes are furnished with each airplane The tie-down cables are fitted with sections of aluminum alloy tubes which make it possible for a man to stand on the ground and fasten the cables in position without the use of a step ladder or other methods usually employed for a high wing

The specifications as submitted by the manufacturers:

Model	No 107
Purpose	Mail transport
Type	Open cockpit sesquiplane
Power plant	One Pratt & Whitney Geared Hornet
Rated horsepower	500 at 1,900 r p m
Wing span (upper)	50 ft.
Wing span (lower)	27 ft
Overall length	35 ft.
Overall height	11 ft. 11 in
Tread	10 ft
Total wing area	452 4 sq ft
Wing loading	13 8 lb per sq ft.
Power loading	12 5 lb per hp
Weight empty	3,380
(Incl 140 lb special electrical equipment)	
Disposable load	3,420 lb
Pay load	2,000 lb
Gross weight	6,800 lb
Fuel capacity	135 gal.
Oil capacity	13 gal.
Mail compartment capacity	175 cu ft.

WITH THE National Air Tour

By JOHN T. NEVILL
Detroit Editor of AVIATION

AS THIS STORY is being written the 1929 National Air Tour has progressed on schedule as far as Jacksonville, Fla. Johnny Livingston, piloting a Whirlwind-powered Waco, is far in the lead on points, with a total of 19 981 78 chalked up to his credit. Second place is held by A. J. Davis piloting another Whirlwind Waco, who has a total score of 17 863 10 to the good. Third place is being filled by a tri-engined Ford with two Whirlwinds and a Wasp, piloted by M. E. Zeller. The total point score for Zeller is 16,784 68. The rest of the first 10 are as follows:

A Fairchild KR, piloted by D. M. Hackman, with a score of 16,679 54, a Bellanca, piloted by George Haldeman, with a score of 14,627 90, a Bellanca, piloted by R. A. Nagle, with a score of 13,723 27, a Command-Aire, piloted by Major Cone, with a score of 12,875 81, a Fairchild KR, piloted by Mrs. Keith Miller, with a score of 12,574 08, a Curtiss Thrush, piloted by Dale Jackson, with a score of 12,118 40, and a Ford, piloted by B. S. Warner, with a score of 12,078 70. The remaining contestants in order of points are Entry No. 35, 34, 31, 1, 40, 28, 21, 32, 25, 14, 24, 19, 18, 4, and 2.

The 1929 Air Tour began with a short 15-mile hop across the Detroit River to Windsor, Ont. The jump to the first nonnday stop at Walker Airport was made without incident, only one of the 29 competing craft failing to score its "figure of merit" for the leg. This entry, a Ford tri-motor equipped with 3 Wasps and flown by B. S. Warner, failed to maintain its required average speed of 106 36 m.p.h., principally because of the leg's brevity, which left but a few seconds leeway at best. A thirtieth entry in the Tour, a Bellanca CH300, which was on the field and ready to start, was withdrawn just prior to the start after it had nosed over and damaged a propeller during belated stick and unstick tests on the morning of the take-off.

After having lunch on the airport at Windsor the Tour pilots took off for the 207-mile flight to Toronto, Ont., a course which took them over the fertile farmlands of the Province, a terrain which gave no hint of the bad country that was to follow. This jump was made with assistance from a helpful tail-wind along the southern side of a large low-pressure area hovering over Hudson's Bay. This wind was emphasized to a greater degree at an altitude of about 4,500 ft. and some of the pilots climbed to take advantage of it. The Lockheed entry, the Cessnas flown by Steve Lacey and Stanley Stanton, George Haldeman's Bellanca and Art Davis' Waco, made the best elapsed time into Toronto. Most of these planes, incidentally, with one or two others, were consistently among the five or six speediest craft on each leg. The Lockheed, flown by Wiley Post, covered the 207 miles between Windsor and Toronto in 1 hr., 13 min. 4 sec., an average of 170 m.p.h. Steve Lacey negotiating the distance in 1 hr. 20 min. 50 sec. George Haldeman came next with 1 hr. 27 min. and 35 sec. Post and Lacey had each flown the 15-mile Detroit-Windsor hop in 4 min. 57 sec. Again only one entry failed to fly the course within the required time, Major J. Carroll Cone, pilot of the Curtiss Challenger powered Command-Aire, having gone off the course and lost time by landing to get his bearings.

Planes of the Tour lined up at Logan Field, Baltimore, Md.

Crowds at Sky Harbor, Nashville, Tennessee, inspecting the Tour planes

Following an overnight stop at Toronto, the planes took off from the Light Aeroplane Club field on Sunday morning and headed northeast toward Ottawa, 228 miles distant. Over this course the pilots found virtually the same weather that has assisted them on the previous day, although the day's flying found an increasing cloudiness that grew into an overcast sky at Montreal. The terrain was bad, and the referee had advised keeping well to the south of the direct line, but few pilots did so. All of the planes landed in Ottawa in good time, the Lockheed again making the best time by flying the 228 miles in 1 hr. 17 min. and 33 sec., or 176 m.p.h. Livingston's elapsed time was 1 hr. 23 min. and 12 sec., that of Lacey, 1 hr. 24 min. and 30 sec. The first mishap of the Tour was brought to light in Ottawa, Miss May Haizlip, pilot of the American Eagle entry, having her hand dressed for an injury received in the air when something came adrift from the engine compartment and struck her. Ottawa was merely a lunch stop, and at 2 p.m. the Tour plane began departing on the 112-mile flight to Montreal.

Like the hop between Toronto and Ottawa the Ottawa-Montreal jump carried the pilots over scores of miles of wilderness where a landing might have been made only with considerable danger. On this leg a brisk direct tail wind obtained at about 6 000 ft., but few, if any, of the contestants climbed that high due to the brevity of the leg. Every plane registered perfect scores for the leg except the Travel Air 6000B flown by Neumann Wadlow, who reported a low oil pressure, necessitating a reduction of his r.p.m. Forty minutes and two seconds was the best time for covering the 112 miles, that being chalked up by Wiley Post in his Lockheed. The next best elapsed times were Haldeman's, 40 min. 31 sec., Lacey's, 41 min. 17 sec., and Reuben Wagner's in the Hornet-powered Boeing 95, 44 min. 23 sec.

The Lockheed's average here was 166 m.p.h. It had so far been the leader on every leg.

A huge crowd, estimated at between 30,000 and 50 000 persons, was on hand at St. Hubert's airdrome, Montreal, to witness the arrival of the touring planes. This is believed to be the largest crowd ever to witness the arrival or departure of any National Air Tour. An air meet in progress on the Montreal airdrome at the time undoubtedly swelled the throng to a number far in excess of that which ordinarily would have watched the Air Tour planes come in. Due to the unprecedented attendance at the airport and to the fact that only two-way road was open between the airport and the city, the tour personnel, numbering more than 100 men and women, had great difficulty in getting into town. In most cases those on the Tour were from 3 to 5 hours in reaching their hotel from the field whereas, they had traversed the 112 miles between Ottawa and Montreal in one hour or less. The evening's banquet had to be postponed to nine o'clock.

DURING THE NIGHT in Montreal a series of moderate showers fell, which did not help the already softened condition of the airport, although the weather had cleared, leaving good visibility and moderate tail winds, when the contestants reached the field the following morning. The 206-mile flight between Montreal and Portland, Me., incidentally, was regarded as one of the most difficult of the entire 5,000-mile route, principally because of the altitude required for negotiating the two mountain ranges between the two points, as well as the weather prevailing over and beyond those mountains.

Although the weather at Montreal was satisfactory, the reports and forecasts indicated probability of trouble ahead, and Captain Hawks instructed that the tour be held until he had flown through to Portland and telephoned that the way was clear. Just before the scheduled starting time there came a message that the weather was bad but possible, and the first plane accordingly got away fifteen minutes late.

C. G. Andrus, government weather bureau expert, travelling with the Tour in the tri-engined Ford, Stanolind II, equipped with radio and used as the Tour's flying "weather bureau," had warned the pilots of the probable weather and many of them carefully checked their navigating instruments before the start of this leg.

Since this was the first leg where the reading of maps took second place to the reading of instruments, and since skillful navigation necessarily plays such a large part in the successful flying of the Tour, it might be well here to outline some of the navigating equipment carried by the various competing planes

The majority of the pilots contented themselves with the instrumental equipment regularly furnished with their planes, and a survey of the instrument boards and their contents served principally to reveal the differences of opinion that exist among manufacturers upon what instruments are needed and how they should be located A few, however, especially among the old-timers, had made modifications to suit their own tastes

DURING the first half of the Tour there has been no necessity for blind flying and little use for any instrument of navigation exceept a compass Most of the entrants come prepared for the worst, however. Of the 28 still in the running after Baltimore, seventeen carried standard combination bank and turn indicators and two more, the two Moths, had the lateral bubble tube without the turn indicator Only the three Cessnas, the two Curtiss Robins, the two Great Lakes Trainers, Miss Haizlip's American Eagle, and Mr. Hackman's Challenger lacked anything of the sort. The urge to provide for possible blind flying did not go so far as to indnee any extensive use of longitudinal inclinometers, hut six planes, including the two Fords, the Boeing, and the Curtiss Condor had rate-of-climb indicators on their instrument boards The others so furnished were the Travel Air monoplane and Mr Nagle's Bellanca

In the selection and mounting of the standard flight and power plant instruments few eccentricities were noticeable Especially to be remarked however, were the very compact grouping of the instruments on a small board on the Fairchild 71 and the enormous dials of the tachometers and air-speed meters on both Curtiss Thrushes With dials fully four inches in diameter, the openness of the scale on the tachometers was still further increased by allowing the pointer to make two revolutions for its full travel Engine revolutions could easily be estimated to within 10 r p m, air speed to half a mile an hour. On the Boeing mail plane, alone among the competitors and showing the results of blind flying experience over long periods on the mail routes the instruments were arranged in the cruciform pottern developed by Lieut J Parker Van Zandt of the Army Air Corps and by his contemporaries and successors, both military and commercial, in cloud-flying studies In straight flight at normal cruising speed, all the pointers arrange themselves to form a vertical and a horizontal line

Under the actual conditions of the Tour only a compass has so far been required for navigation. The compass has been almost indispensable in spite of generally clear weather, for in the swampy forests of some parts of the South landmarks shown on the maps are too far apart to be depended upon as a sole guide While a large proportion of the pilots used the standard aircraft compass with numbers on the edge of the "card," countersunk into the instrument board just below the pilot's eye and with a lens in front to magnify the scale, neither that type nor any other was by any means universal Only two earth inductors made the Tour on competing ships those being fitted to George Haldeman's Bellanca and Mr. Zeller's Ford The Cessnas and the Ryan had their compasses mounted behind the pilot's head, the readings being taken in a mirror, while the Curtiss Robins and the Fairchild monoplane also had the instrument overhead but far enough forward to be read directly from the seat. The Fairchild had a compass with an unusually large card some four and a half inches in diameter In a number of cases an aperiodic compass of British manufacture had been fitted on the cockpit floor, either as the sole reliance or in addition to the instrument on the board and their performance was being generously commended by those who had them, as was that of the earth induction type On the Curtiss Condor and the Lockheed caution had been carried to the extreme of carrying three magnetic compasses as widely separated from each other as they could be and still remain within the pilot's range of vision

Only 28 of the 29 contestants departed from Montreal on their scheduled time, the Curtiss Condor being delayed on the airport awaiting the arrival of one of its two pilots. A series of blowouts on a motor car in which the pilot was riding to the airdrome caused the delay This story, coupled with bus-riding episode later experienced by the Condor passengers, pictured the reliability of motor car travel in a most unfavorable light

At any rate, the Condor, piloted by J. W. Crosswell and K. E Voelter, took off about 40 minutes after their official elapsed time had started and arrived safely in Portland, even though it was one of the 11 entries crossing the finish line in the Maine city behind schedule Upon reaching the mountains, some peaks of which towered to a height of 6,000 ft, the pilots found clouds forming

AS WAS EXPECTED some of the contestants became lost in the cloud-laden heights above their virtually unmarked course and were late into Portland as a result. One or two others wandered up and down the valley between the two ranges until they were about out of gas and had to land to replenish their fuel supply Those late into Portland included all three women pilots, Miss Harrell, Mrs Miller and Miss Haizlip, and also Wadlow, Al Krapish, flying a Gypsy Moth, Capt William Lancaster in a Great Lakes trainer. R E Nagle in a Bellanca CH300, Arthur Davis. Donald Mather in the Wallace Touroplane, J L McGrady, in a Curtiss Thrush, the Curtiss Condor, William Welborn in a Wright 165 hp Spartan, and Hackman in a Fairchild KR-34 Welborn incidentally, turned back and landed at Montreal shortly after his take-off, with a cracked piston Mechanics from the Wright Aeronautical service ship, a tri-motored Ford in charge of George F, Chapline, remained on the field and repaired his engine Late in the afternoon Welborn again took the air, hut weather conditions caused him again to return to Montreal where he remained overnight The following morning he took off, checked in at Portland, Springfield, Mass. and New York and caught the Tour at Philadelphia that night

Weather conditions over the Green and the White Mountains also caused the official press plane, a tri-engined Ford owned by the Firestone Tire and Rubber Company, to turn back to Montreal after negotiating the major portion of the Montreal-Portland leg This plane, piloted by L W Bryant of the Ford Motor Company, encountered the worst of the low-pressure area after having traversed the first mountain range and crossed the valley between the two ranges After refueling in Montreal the press plane took off about 3 p.m for Springfield in order to catch the Tour planes there On this flight it was accompanied by the Wright service plane, the crew of which had completed repairs on Welborn's Spartan and saw him off on his second start for Portland. Thick fog over the Berkshires, however, caused both tri-engined Fords to abandon their course and land at Albany, N Y, where the night was spent On Tuesday morning the Wright plane departed early and joined the Tour at Springfield The press plane flew down the Hudson River valley and landed at Roosevelt Field just before the arrival of the first Air Tour plane from Springfield

Despite the difficulties under which the leg was flown many of the contestants sped over the White and the Green Mountains in skillful fashion and landed on the Portland airport in good time, even though they were drenched by getting there in a hard shower Steve Lacey pushed his Cessna across the distance in the briefest time, his record being 1 hr 14 min and 35 sec, making 166 m p h The Lockheed was second best with 1 hr 25 min and 27 sec, George Haldeman third with 1 hr 26 min and 20 sec

When the course between Portland and Springfield, 152 miles in length was flown on Monday afternoon the last of a series of west to northwest showers were encountered, with head to quartering winds of sufficient strength to make 18 of the contestants arrive late in Springfield A nineteenth plane receiving an imperfect score for this leg was the Spartan flown by Welborn, which passed over the course one day behind schedule The only pilots, in fact, who opened up their throttles enough to get them into Springfield "under the wire" were Haldeman, Mather, Wagner, Jackson, Shelton, O'Brine, Livingston, Post, Lacey, and Pears Wiley Post clicked off the best time for the jump, his Lockheed making the run in 1 hr, 2 min 20 sec, a drop of speed to 146 m p h Lacey flew it in 1 hr 6 min 57 sec, Livingston in 1 hr 11 min 37 sec, Haldeman in 1 hr 15 min 11 sec and Wagner in 1 hr 17 min

On Tuesday the Tour staged two short jumps, both being flown under bright skies with few clouds and high visibility The wind was from the northwest becoming westerly at the higher altitudes Roosevelt field, 112 miles from Springfield, was the day's lunch-stop

The National Air Tour arriving at Miller Field, Macon, Ga

Due, perhaps, to the mileage and the pilots' familiarity with the terrain, practically all of the contestants seemed to arrive over the finish line at the same time Three of the competitors, however, Wadlow, Hackman and Welborn, were registered over the line behind flying schedule, the latter, as explained in foregoing paragraphs being at that time well on his way from Montreal

Including Welborn, who did not catch the Tour until after it had reached Central Airport, Camden, N. J. the Philadelphia landing site, seven of the contestants were late on the 96-mile hop into Philadelphia, others failing to fly the course within scheduled time being Lancaster, Wadlow, Nagle, Zeller, Rowland and Stanton Rowland, flying a Warner-engined Cessna a ship in seventh place at the time, became ill on the New York-Philadelphia flight, his illness later forcing him to withdraw from the Tour Post, Lacey, Livingston, and Haldeman, made the four best times on the forenoon hop They clipped off the 112 miles in 43 min 15 sec, 44 min 0 08 sec 49 min 45 sec and 50 min 10 sec, respectively The Wasp-powered Lockheed again led the speed-demons in the afternoon, with a record of 39 min, 35 sec between New York and Philadelphia Lacey's Cessna was second best on this leg with 40 min 24 sec, Davis, third, with 45 min 49 sec, Haldeman, fourth, with 46 min 28 sec and Livingston, fifth with 46 min 55 sec The best time between New York and Philadelphia showed an average of only 146 m p h., the slowest leg thus far

THE FOLLOWING MORNING (Wednesday) the Tour began its plunge into the Southland—a jaunt that carried it as far south as Jacksonville Fla., Baltimore and Richmond being visited on Wednesday, Winston-Salem and Greenville on Thursday, and Augusta and Jacksonville on Friday

Welborn's Spartan again being in the line-up and taking off in regular order with the other entries, the 90-mile flight to Baltimore, Wednesday's noon halt marked the first time since the Tour began that all contestants scored perfect records for any one individual

leg. This state of affairs, a delightful one from a book-keeping point of view as well as from the pilot's angle filled Arthur G. Schlosser and E. P. Crocker, the Tour's very much overworked scorers with extreme optimism. But the optimism was short-lived. The Wallace Touroplane was lost to the Tour on the take-off for Richmond, the plane's engine quitting just after the wheels had left Logan Field. Donald Mather, the pilot, "set her down" with little injury to himself or the occupants of his craft, but with considerable damage to the plane. Another mishap occurred on the same afternoon, Mrs. Keith Miller ground-looping her Fairchild KR-34 upon landing in Richmond and breaking off the left wheel. The wheel, however, was replaced in short order, permitting the woman pilot to take off on schedule Thursday morning. Wadlow's Travel Air and Stanton's Cessna were the only two craft failing to negotiate the 128 miles between Baltimore and Byrd Field, Richmond, within their allotted time. The morning hop had been made under clear skies with light cross-winds, coming mostly from the northwest. In the afternoon there was very little wind of any kind. Best elapsed times recorded for the day's two flights were: Philadelphia to Baltimore—Lacey, 35 min. 0.09 sec., Post, 35 min. 18 sec., Davis, 35 min. 50 sec., Baltimore to Richmond—Post, 50 min. 55 sec., Lacey, 53 min. 50 sec., Livingston, 59 min. 34 sec., Davis, 60 min. 19 sec., and Wagner, 60 min. 35 sec. Post and Lacey were both averaging about 150 m.p.h. The pilots of the fastest planes appeared to be keeping a little more in reserve than during the first days of the tour.

The Baltimore-Richmond hop was the tenth leg of the Tour route.

THURSDAY'S FLYING included a 183-mile hop from Richmond to Winston-Salem, N. C., in the forenoon and a 152-mile afternoon flight to Greenville, S. C., where the night was spent. The first leg of the day introduced a wee bit of the unmarked lands of the south and compelled the pilots to utilize the compass considerably. The Warner-engined Cessna was kept on Byrd Field when Earl Rowland, its pilot, who had been feeling badly for several days, was taken to a hospital. Later, the Cessna was brought on by Joseph Meehan, reserve pilot, who had been flying with Steve Lacey.

The Curtiss Condor lost its position of fifth "in the money" on the Richmond-Winston-Salem leg. A broken magneto shaft on one of the motors shortly after its take-off for Winston-Salem forced it to turn back and land at Richmond for repairs. Its passengers were loaded onto a motor bus and started for the next control point, where the Condor was to pick them up as soon as repairs were effected. A series of two or three breakdowns involving various busses they were utilizing caused the passengers to spend the night on the road. They arrived in Winston-Salem early the following morning, dirty and weary and with a Homeric tale to tell, but just in time to be taken aboard the Condor and flown to Greenville. Another entry left standing on the Richmond airport was the Kinner-powered American Eagle, flown by Miss Haizlip. This plane was kept in Richmond with motor trouble, but departed in time to catch the Tour in Greenville before nightfall. Besides the Condor, the Warner Cessna and the American Eagle, Post's Lockheed, Lacey's Cessna and Lancaster's Great Lakes trainer were late arriving over the finish line in the North Carolina city. Lacey reported having to land to replace two blown spark plugs. It was the first time either Lacey or Post had failed to annex to their respective score their full figure of merit. On the afternoon hop six pilots were late into Greenville, the group including Miss Haizlip, Crosswell, Meehan, Lancaster, Miss Harrell and the old reliable Dick Pears. Lancaster said he was compelled to land enroute for gas. Pears reported that his compass went bad on him, carrying him off his course.

THE DAY'S TWO LEGS were flown before fair tail winds, the best flying level being at about 3,000 ft. Al Krapish, pilot of one of the Moths smashed the undercarriage of his ship upon landing in Greenville. He "squashed" in demonstrating the plane's Handley Page slots. The damage was repaired, but not in time to permit him to arrive in Augusta, Ga., on scheduled time the next day at noon. Others late into Augusta were Reuben Wagner in the Boeing and Wadlow in the Travel Air. The Condor, with the passengers picked up at Winston-Salem, had landed upon the Greenville airport in plenty of time to take off on the appointed minute. Earl Rowland's Cessna was flown into Augusta by Meehan, but in Augusta the ship was taken over by Henry Poindexter, of Raleigh, N. C. For the morning's flight the sky was cloudless with moderate to fresh quarterings northeast to east winds at all levels under 7,500 ft.

Due to a series of hard squalls met by the advance planes between Augusta and Jacksonville the competing craft, at the suggestion of Mr. Andrus, were again held at a control point until definite reassurance of fairly steady conditions enroute was obtained. The tri-engined "Firestone" Ford, carrying the press, meanwhile had taken off prior to the warning, and plowed through to Jacksonville. The clouds, occasionally emitting brief showers, set a ceiling of about 1,500 to 2,000 ft., although the marshy, flood ridden miles between Augusta and Jacksonville would make a higher altitude much more desirable for single-engined flight. Many of the pilots acclaimed this the worst country of the entire tour, even worse than the stretch through the White Mountains.

Although cross winds from east caused the pilots to have to "crab" their planes over the course, only one was late into Jacksonville, Newman Wadlow receiving that dubious distinction. Henry Poindexter, making his first landing on the Tour, got into soft ground on the Jacksonville airport and nosed his Cessna over, bending a propeller.

HIGHEST SPEEDS made on the hops of Thursday and Friday were as follows: Richmond-Winston-Salem (183 miles)—Young, 1 hr. 9 min. 41 sec., Davis, 1 hr. 18 min. 33 sec., Stanton, 1 hr. 19 min. 3 sec. For the first time, Post was not among the five leaders. The performance of Young's Ryan in leading the way and averaging 158 m.p.h. caused general amazement.

Winston-Salem to Greenville (152 miles)—Post, 55 min. 18 sec., Stanton, 1 hr. 4 min. 58 sec., Haldeman, 1 hr. 5 min. 29 sec., Nagle, 1 hr. 6 min. 0.07 sec., and Wagner, 1 hr. 6 min. 18 sec. Greenville to Augusta (100 miles)—Lacey, 38 min. 11 sec., Stanton, 40 min. 0.01 sec., Haldeman, 40 min. 57 sec., Post, 41 min. 0.05 sec., and Livingston, 43 min. 0.02 sec. Augusta to Jacksonville (210 miles)—Post, 1 hr. 15 min. 33 sec., Lacey, 1 hr. 20 min. 48 sec., Stanton, 1 hr. 27 min. 12 sec., Livingston, 1 hr. 29 min. 32 sec., and Nagle, 1 hr. 30 min. 0.08 sec. On the last three legs the Lockheed averaged 161 m.p.h., while Lacey's Cessna made 156 from Greenville to Jacksonville.

AIRLINES IN THE Canal Zone

By Frank Haynes

Hamilton all metal plane operated daily between Balboa and Cristobal

WHEN Balboa and his hearty band of Spanish followers gazed out for the first time and beheld the calm, unruffled waters of the Pacific Ocean, the event marked the end of a journey of less than 50 miles that took nearly two months to complete. With the advance of science the time was eventually cut down to 2 hours by train, and today, the trip is negotiated in 20 min. via airplane and a regular schedule is maintained.

Early this year, a group of local business men headed by Ralph Sexton, formerly employed by the Panama Canal, but then having a construction company of his own, furnished the initiative and the majority of the capital and formed Isthmian Airways, Inc. In the face of strong competition the company secured the consent of the United States government to run planes in a trans-Canal and intra-Canal Zone service. It also secured the consent of the Panama government to run a service to remote parts of the interior.

The company was incorporated under the laws of Delaware and the $25,000 that the Canal Zone government requires of all companies operating in the Zone was deposited. It was agreed to use seaplanes on the Canal run because in the event of any trouble the plane could land in any part of the Canal as the entire run is over water.

The plane, a seven-passenger Hamilton all-metal sea plane powered with a Pratt and Whitney Hornet engine, was the first commercial plane to make a transit of the Canal via the air with a full load of passengers. From May 5 until July 1 a total of 359 trips was made across the Canal without any mishap. Figures released by Mr. Sexton indicated that over 1,400 people travelled in the plane and that nearly 18,000 lb. of freight were carried.

This service across the Canal became so popular that another plane of the same make was ordered and placed in the service on June 10. The service has proved invaluable to steamship lines who have used the service to transfer ship's papers and members of the crew across the Canal to avoid missing the boats.

Two all-steel hangers have been constructed, one at the Balboa base, and the other on Folks River near the Cristobal inner harbor. Passengers have perfect facilities for rest and comfort there before embarking or disembarking. It is only a few minutes ride by automobiles to the main business sections of Panama City and Colon. It has been proved that a person can leave the Hotel Central, in the center of Panama City and be in Colon 50 miles across the continent, just 30 min. later.

The first plane across in the morning leaves Balboa at 6:30 and returning, leaves Colon at 8:00. Setting out again from Balboa at 9:30 a.m. it remains in Colon until 1:30 p.m. and arrives back in Balboa a few minutes before the noon train from Colon arrives there. It leaves Balboa again at 4:00 p.m. and returns to Balboa at 5:00 p.m. for the night.

SPECIAL SIGHT-SEEING TRIPS have been arranged and many parties from the tourist boats have traveled the Canal on the steamer and then returned over the Canal via air. The trip one way across the Canal is $10 and the round trip rate is $15. Special trips by arrangement with the plane remaining aloft for an hour on a scenic trip over parts adjacent to the Canal and down the Atlantic and Pacific coasts for a few miles, have been arranged at a cost of $12.50 per person provided six persons make the trip.

The plane flies at an altitude of approximately 2,000 feet and a clear, birds-eye view can be obtained of the Canal and the wonderful construction. It can be more easily appreciated from the air and the operation of the locks and the magnitude of the famous Gaillard Cut can be appreciated better than from a transiting vessel. Employees of the Canal who helped build it have flown over the Canal and commented on its greatness which hitherto they had not realized.

An American newspaper printed in Panama City is delivered to its readers across the Isthmus on the first plane in the morning and is on the streets for sale at 7:00 a.m., exactly the hour that its competitors' papers are leaving on the train from Panama. Sales have been negotiated across the Isthmus via phone and 30 min. later the goods have been delivered via plane. This speedy service, plus a willingness to oblige at all times, has endeared the operators of the service to residents of Panama and the Canal Zone, and has assured for it a profitable future.

THE BRITISH State Airship R101

By AVIATION'S
British Correspondent

Rear quarter view of the British State airship in her hangar at the Royal Airship Works, Cardington, England

THE STATE AIRSHIP, R101, is complete at last after some four years effort, in which the first 18 months was mainly devoted to pure research work in wind tunnels and upon the old R33, now broken up, and the last two years given to actual construction. By the time this dispatch appears the ship should have actually flown, but at the time of mailing she is waiting complete in the shed for a windless dawn to be manhandled on to the new mooring tower 200 ft. high at the Royal Airship Works, Cardington, 50 miles from London. [It was not until Oct. 12 that it was possible to take the ship out to the mast, and it was not possible to make the first test flight until Friday, Oct. 18.—Ed.]

Before she was due to leave the shed the Air Ministry permitted a very full examination of the completed ship and also gave out certain details of weights and expected performance. These add considerable to facts previously made public, and in view of American interest in airship development some of the impressions which followed a careful examination of the ship may also be useful. It is not necessary to describe the general construction of R101 at any great length, as this is common property by now. However, the main longitudinal girders of R101 are triangular in section with booms of high-tensile steel strip drawn into tube form, by Boulton and Paul of Norwich, with duralumin webs and forged duralumin end fittings, all attached through pin joints. The use of pin-jointing, and elimination of an intermediate degree of fixity, helps to increase the accuracy of the stress analysis. The main transverse frames are also of triangular section and are deep enough to form a rigid ring without any radial bracing, while the gas bags are inclosed in a special form of netting. There is a loss of gas volume by the use of such deep frames, but the designers contend that the whole system enables a much better system of transfer of gas lift to the ship, and avoids all undesirable strains through surging of the gas or the deflation of one bag and consequent abnormal pressure conditions within the hull. [The use of duralumin and steel structural members together has been generally avoided in America. Dr. Dornier's flying boats furnish the most notable precedent for employing a composite structure of that kind.—Ed.]

THERE HAS BEEN much criticism from a small but vocal band of opponents of airships at the delay in completing the R101 and the other vessel; but much of it has been completely ill-informed and it may be said that it has little substance as applied to the airship itself, but has some apparent force when directed to the actual expected performance. So far as can be judged at this moment, when the ship has not flown, there is not a single idea among the many novel features in the design and actual construction of the R101 which justifies destructive criticism; but undoubtedly the new Diesel-cycle engines of R101 have not come up to expectations and have seriously affected the performance.

These are eight-cylinder-in-line Beardmore Tornado Diesel engines, each cylinder with a bore of 8¼ in. and a stroke of 12 in., developing 585-650 hp. per engine. This is about 100 hp. less than was originally expected, and the engines have worked out very much heavier than was originally anticipated, two serious disappointments. The cumulative effect of the extra weight in the engines throughout the power nacelles, and of the modifications in the structure of the ship necessary for carrying this extra distributed load, has meant the addition of an extra 8½ tons, and, of course, the passenger load is correspondingly reduced.

CONSEQUENTLY the ship with her present engines is not expected to carry more than 52 passengers instead of the 100 for whom accommodations, on most comfortable lines, have been provided, and the top speed, already reduced by the fact that so far no hollow metal propeller has stood up to the torque of the engine, due in part to the high peak torque load in the Diesel cycle. This means that the variable-pitch propellers, the operating mechanism of which is otherwise satisfactory, cannot be used simply because the blades fail, and wooden propellers of fixed pitch have had to be substituted. This, in turn, has necessitated one power unit being reserved entirely for reversing purposes, being fitted with an airscrew for going astern, so only four engines totalling 2,430-2,600 hp. are available for forward speed.

Therefore, instead of a designed top speed of 80 m.p.h. the official estimate is now 70 m.p.h. with a cruising speed of 63 m.p.h. and to this extent the critics have been able to make capital out of the failure of the power units, and not of the airship itself, to come up to promise. But even with the present engines certain notable successes are being attained. When R101 takes the air she will be the first airship which does not rely upon gasoline. She has divorced that unpleasant companionship of hydrogen and volatile fuel; she is burning a fuel oil which costs $25 a ton as against the $125 needed for gasoline per ton, [In the U. S. this figure would be about $70 for gasoline.—Ed.] the fuel, weight for weight, gives from 25 to 30 per cent more range; the engines have become simpler by the elimination of all electrical installation, and, so far as type tests can show, appear to be perfectly reliable within the powers at which they are now rated.

Wing Comdr. T. R. Cave-Brown-Cave, who is in charge of the machinery installation, is definitely satisfied with it. The weight of these Diesels is, I understand, between 4 and 6 lb. per hp., taking only the engine. Wing Comdr. Cave-Brown-Cave says that they start up with the utmost ease, and more trouble is caused by the small auxiliary gasoline engine used to turn over the big ones for starting.

Perhaps the power eggs or nacelles, had better be explained in more detail at this point. Each is of excellent streamline form to reduce head resistance, and contains the main Tornado engine. Linked thereto by a clutch is a Ricardo four-cylinder gasoline engine. This engine is fed by a gasoline tank contained in the power car in a tubular tank. At the first hint of fire, a release handle is pulled, and the whole tank disappears into the blue. This auxiliary engine in two of the five cars can be clutched into an air compressor, the purpose of which

Both of the British airships contracted for some five years ago are now nearing readiness for trial. Contrary to the general expectation a year or so ago, the government-designed ship is receiving its first test ahead of that constructed by Commander Burney and the Airship Guarantee Company. The designers of both ships have broken boldly away from past experience and Zeppelin practice, and have introduced a great number of structural innovations, which make their trials of acute interest to the whole world. In anticipation of the first flight of the R101, our British correspondent gives a number of details of its design and construction not previously available for publication.

is to provide pressure to blow fuel or ballast about the ship; the other three engines are coupled to generators to generate current for various purposes such as lighting cooking, etc These generators are also coupled to a constant speed windmill, projecting forward of the car, and at any speed over 40 m.p.h the windmill takes up the work of generating current and the motors, of course, are stopped

To start the main engines, Wing Comdr. Cave Brown-Cave says, the release taps over the oil injection jets are opened and the engine run by the gasoline engine with a decompressor valve open until the vent pipe of each jet shows that oil is flowing Then the cocks are shut the decompressor closed and the throttle opened to a considerable extent, when the engine fires straight away From then on engine speed is controlled much as a locomotive driver controls train speed and as simply The engine mechanic merely pushes forward one lever, the effect of which is to lengthen or shorten the actual period during which the pump is injecting oil

The water cooling represents another novel step, for the evaporative system is used, the only water in circulation being in the jackets Thus forms steam and the vapor is led up the side of the airship to a radiator The steam, then condensed to water, runs back by gravity to a header tank, except in the case of one retractable radiator in the bottom of the ship This serves two engines and is used to heat the passenger quarters by a process of retracting it into a flow of air being forced by a fan through the various lounges and cabins of the ship Its efficiency seems proved for with it almost in, when two engines were run in the shed, the temperature in the passenger lounge quickly rose to between 115 and 120 deg F

The engine exhausts represent another piece of interesting design, and are really large cylinders about 6 to 9 in in diameter with the whole of the upper part perforated with holes Each branch from an exhaust port comes into the cylinder at a true tangent so that the gases from each engine cylinder start to circle around the exhaust silencer gradually losing pressure as they swirl past and out of the perforated holes Thus there is little back pressure and the engines are noticeably quiet The whole installation is arranged in the power nacelles so that a mechanic can work on any part of the engine It is stated that even a complete cylinder could be changed in the air Each power nacelle is interchangeable so far as the attachments to the ship are concerned, and the scheme is not to change engines, but complete cars

The arrangement of the five engines is two attached well forward to frame 4 two to frame 9 and one on the center line at frame 11 This engine is a forward engine so as to secure the utmost control value from the slip stream onto the rudder, the lower balance of which is practically in line with the propeller: and the reverse engine is the forward port unit It is stated that very little side pull is found with this offset position, and that it has the advantage of discharging its slipstream in a direction where it causes no disturbance to the even flow of air past the ship

One of the power plant nacelles on the R101

THERE ARE many more interesting ideas in the machinery installation, such as the system for shifting weight about by air pressure, servo motors for the controls, emergency releases for fuel, and automatic gas valves capable of dealing with a sudden rise at the rate of 45 to 50 m.p.h. It is impractical to deal with them all in one article, but mention might be made of an electrical indicator in the actual bearing tube of the nose mooring which tells at once whether the ship is bearing down or pulling up on the nose cap This merely registers the deflection of the stout horizontal tube through which the actual coupling to the nosecap passes the degree of deflection being calibrated in tons

Before proceeding any farther the actual measurements and weights of the ship which is of 5,000,000 cubic feet capacity may be given and for the purposes of comparison they are set against those of the Graf Zeppelin so far as they are known:

	R101	Graf Zeppelin
Length, feet	732	772
Diameter	132	100
Speed, maximum	70 m.p.h	80 m.p.h
Speed, cruising	63 m.p.h	68 m.p.h
Range with normal pay load	3,000 miles	6,250 miles
Normal pay load	52 passengers	20 passengers 15 tons freight
Total displacement	151 tons	107 tons
Structure, weight without power cars	81 tons	
Weight of power cars, compl	21 tons	
Engines, number	5	5
Engines, type	Beardmore c 1	Maybach
	585-650 hp	530 hp
Total hp	2,600 hp forward 650 astern	2,650 hp

It must be remembered in this comparison that the British ship is built to conform to a high factor of safety, and, as Sir Hubert Wilkins said in a recent issue of AVIATION [Sept 21.—Ed.], whereas the Graf Zeppelin is designed to withstand a vertical gust of 15 m.p.h only, R101 is intended to cope with one of 45 m.p.h the worst known condition and only likely to be met with in the tropics

The first impression of the ship on entering the huge shed at Cardington is the perfect smoothness of the silver skin, and this is, in part, due to the system of

The main lounge showing the veranda and glass paralled side of the ship

tightening girders practically light longitudinals which can be screwed out to give any desired degree of tension and so ensure that the envelope is always at its best aerodynamic efficiency Then at various points along the main frames the envelope can breathe very much on the lines of the gills of a fish Forward by the nose there is a ring of holes which not only admit air to ensure a free and continuous current throughout the ship to clear away all fumes but also ensure that the pressure inside and outside the envelope remains constant The gills deal with any excess of internal pressure during swift changes of altitude Then to ensure that the skin is always tight in the slipstream of the power cars a small scoop is fitted some distance behind the propellers; this naturally is constantly receiving air at pressure and feeds it into a sort of double skin over the necessary area Thus the envelope in this region is always taut, regardless of the tightening girders, and friction is prevented

A BRIEF REFERENCE may be made to the passenger accommodation, which approaches the point of luxury with a large lounge stretching right across the ship in the bottom portions of bays 6-7 and 7-8 with verandas on each side from which a comprehensive view of the outside world is obtained through safety glass panels in the sides of the ship The lounge is attractively furnished with easy chairs and settees for 100 people and on the same deck is a dining room, also lighted from large panels in the side of the ship, that accommodates 50 people Under this, on the lower deck, is an electric kitchen with a small elevator to the dining room above, and on the lower deck also is a smoking room that accommodates about 30 persons It is a most acceptable addition to the conveniences of airship travel Thus has the same three-ply floor as the rest of the ship but it is covered in metal while the walls are fireproofed There is forced ventilation here and this section, the kitchen, and the wireless room are divorced entirely from the ventilation of the rest of the passengers' quarters, and are continually fed with a stream of fresh air, whereas in the other portion fresh air is merely added to that already in circulation. There are two berth banks, and the washing accommodation is grouped so as to keep the water used under control and to save weight in piping and in other directions

The total area of the upper deck, exclusive of the promenades, is 5,550 sq ft, and that of the lower deck 1,730 sq ft with ability to be extended to 4,000 sq ft. if necessary The entire passenger accommodation is so slung that there are no localized strains on the frames or girders. The average weight of the girder work for these decks works out at 1.2 lb per sq ft, and the covering, principally birch three-ply strengthened below with ribbing of spindled spruce, is 0.8 lb per sq.ft., and on the open portions of the deck is made to withstand a uniform dead loading of 170 lb per sq ft

The home trials are expected to take from three to six months, after which the initial Empire flight will be made to India with the British Secretary of State for Air, Lord Thomson, as the passenger of honor.

GENERAL NEWS

All-Western Show Exhibitors Named

Forty-Eight Firms Were Signed by Oct. 16

LOS ANGELES (CALIF.)—More than 70 per cent of the space available for exhibits at the All-Western Aircraft Show, to be staged in Los Angeles Nov. 9 to 17, inclusive, were contracted for by Oct. 16, according to Cliff Henderson, managing director. Tentative reservations indicate a complete sell-out of the show building which has a total of 100,000 sq.ft. of available floor area, and it is thought that many products will be displayed in hotel lobbies and downtown store windows.

Popular interest in the All-Western Aircraft Show has been fanned by an advance program which has taken advantage of every form of publicity, including intensive radio broadcasts. A large model plane show will be held in conjunction with the main exhibition, and this, in connection with a guessing contest being conducted by one of the large daily papers and featuring planes on exhibit in the show building, is expected to swell the attendance.

An all-California Air Tour, touching at thirteen cities from Nov. 4 to 7 inclusive is calculated to attract the widest possible interest to the show week. There are 33 planes already registered for this tour with the probability that from 50 to 60 planes will actually make the four day tour of the State.

Thirty-Nine Planes Listed

A total of 48 exhibitors had signed contracts by Oct. 16, this number including eighteen aircraft manufacturers or their representatives and calling for the exhibition of 39 planes. Aircraft exhibitors and products to be shown include: Fairchild Airplane Manufacturing Company, two Fairchilds and two Kreider-Reisners; Angelus Aircraft Corporation, four or more Aeromarine Klemms; Ruckstell Corporation Ltd., three or more Great Lakes; Pasadena Aircraft Corporation, one "Javelin"; Moreland Aircraft Company, one Moreland; Douglas Aircraft Company, one Douglas military plane, type unnamed; Curtiss Flying Service, four planes not yet designated; Dr. H. H. Hawkins, one Barling; Crook Company, one Gipsy Moth; H. C. Lippiatt, two Travel Airs; Timm Airplane Corporation, one "Collegiate" monoplane; Parks Aircraft, Inc., two Parks; Joseph Kreutzer, Inc., one Kreutzer tri-engined "Air Coach"; Aero Corporation of California, four planes not yet designated; Detroit Aircraft Corporation, one Lockheed, one Ryan, one Eastman flying boat; American Aircraft Corporation, two Waco biplanes; Emsco Aircraft Corporation, one "Cirrus" trainer, and one tri-engined "Challenger"; Bach Aircraft Company, one Bach tri-engined transport.

Accessory exhibitors include: Pacific Aeromotive Corporation, representing Berry Brothers; Firestone Airplane Tires; Flightex Fabrics; Standard Steel Propellers; Scintilla Airplane Magnetos; Stromberg Airplane Carburetors; Wright engines; Aero Supply Manufacturing Company, and Bendix brakes and wheels. *Western Flying* Magazine; MacWhyte Company, Kenosha, Wis.; H. H. Robertson Company, Pittsburgh, Pa.; Brownback Motor Laboratories; Irving Air Chute Company; Shell Oil Company; California Panel and Veneer Company; Union Oil Company; Goodyear Tire and Rubber Company; Pacific Finance Corporation; Axelson Aircraft Engine Company; Pacific Goodrich Tire and Rubber Company; Boothe Company; California Safety Appliance Company; Western Auto Supply Company; Western Aviation Supply Company; Standard Oil Company; Crouse-Hinds Company; Los Angeles Metropolitan Airport; Champion Spark Plug Company; McKinnon Flying Publications; Shaw-Palmer-Bakewell Company; Kinner Airplane and Motor Corporation; Scully Brothers, Rule and Son; Bullet Air Cleaner Company; Behrendt-Levy Company; Texas Oil Company; Nicholas-Beazley Company; Harwen Products Company; *Air Mechanics* Magazine; *Aero Digest* Magazine; Dawn Motor Company; Maddux Air Lines; Western Air Express; Pacific Auto Corporation; Richfield Oil Company; Pacific Scientific Company; General Instrument Company.

Livingston Wins National Air Tour

DETROIT (MICH.)—With 45,672 points to his credit, John Livingston, piloting a Waco biplane powered with a Wright J-6 225 hp. engine, was declared winner of the National Air Tour at the close of the classic here on Oct. 21. Arthur J. Davis, flying a similar Waco took second with a score of 41,108.

Twenty-four of the 29 planes which left here on the 5,017-mi. journey Oct. 5 completed the course. A short flight from Kalamazoo, Mich., constituted the final leg of the long flight.

Besides Livingston and Davis, the others to finish in the first ten were: Zeller Ford; Crosswell Condor; Haldeman Bellanca; Nagle Bellanca Cone Command-Aire; Miller, Fairchild; Welborn, Spartan; and Warner Ford.

The concluding tour feature story by AVIATION's Detroit editor will appear in the next issue.

Bourdon Aircraft Merged With Viking

NEW HAVEN (CONN.)—A merger of two New England airplane companies—the Viking Flying Boat Company of this city and the Bourdon Aircraft Corporation of Providence, R. I.—has been effected. Manufacturing activities of the half-million dollar corporation which results will be centered under the Viking name in New Haven, Conn.

Robert E. Gross is president and treasurer of the combined organizations, with Reginald D. Thomas, vice-president and general manager of Viking, retaining that post in the new corporation. Franklin T. Kurt, former chief engineer of the Bourdon firm, will join the Viking company as engineer.

Allen P. Bourdon who with Franklin T. Kurt developed the Bourdon Kitty Hawk plane, will be executive vice president. The Bourdon craft will be adapted for use on floats. They will be used with the Viking machines at company bases located at New Haven and Miami.

Two approved type certificates, No's. 134 and 166, were granted by the Aeronautics Branch for the 105 hp. Siemens-engined Kitty Hawk and for the 100 hp. Kinner-powered model, respectively. Measuring 21 ft. 11 in. in length and 28 ft. in span, the Kitty Hawk is a three-place open land biplane. Welded steel tubing is used in the construction of the fuselage, with wood and fabric forming the wings.

McCracken and Rogers to Tour

CHICAGO (ILL.)—William P. McCracken, former Assistant Secretary of Commerce for Aeronautics, and Leighton W. Rogers, head of the Aeronautical Trade Division of the Department, are beginning an aerial tour of the trans-continental mail line and the Pacific Coast routes. Mr. Rogers, on leave from Washington, recently qualified for a Limited Commercial license at Parks Air College, St. Louis.

Stocks of 82 Firms Offered at 248 Million

BOSTON (MASS.)—Securities of 82 aviation companies were offered to the public for the year ending Aug. 31, 1929, a survey of aviation stocks show. At offering prices the value of these securities was $248,200,000, of which Aviation Corporation, United Aircraft and Transport Company, and the Curtiss-Wright Corporation and subsidiaries, offered $108,235,000, or 43 per cent. These figures were disclosed at a recent meeting here of the Executives Club, Boston Chamber of Commerce, in an address made by Harvey L. Williams, president of Air Investors, Inc.

Included in the 82 companies, were 45 which made public offerings, at offering prices, amounting to $207,048,000. These same firms were valued at $392,301,000 at offering prices for their respective securities, and at $398,031,000 at market prices on Sept. 30 this year, based on total outstanding shares (shares bought by the public and all shares otherwise previously or subsequently offered according to latest available reports).

On Sept. 30, 1929, 33 aviation corporations had securities listed on the New York Stock Exchange and New York Curb Exchange, with a total market value of $727,336,000. Of this number, 26 were operating companies with a total market value of $683,832,000 and seven were investment corporations with a market value of $43,504,000. Curtiss-Wright Corporation, Aviation Corporation, Bendix Aviation Corporation and United Aircraft and Transport Corporation, accounted for 73 per cent of the total market valuation of the 33 companies, or $532,846,000.

Touring Savoia S-55 at Belize

NEW YORK (N. Y.)—Reports received here concerning the flight of the Savoia Marchetti, S-55, which left Port Washington L. I., on a long inland as well as over water flight, indicate it has reached Belize, British Honduras. Upon leaving St. Louis, it flew to Memphis, Tenn.; New Orleans, La.; Mobile, Ala.; Pensacola and Miami, Fla.; and Havana, Cuba. The seaplane flew over the Island of Turiquano on the North Coast of Cuba, which is being considered as a West Indies air terminal. In commenting on the long trip, Albert Kapteyn, secretary and treasurer of the American Aeronautical Corporation, which is building Savoia-Marchetti craft in this country, said it had proved the feasibility and safety of seaplanes, even over long stretches of land. He said there were many small mountain lakes in the Rockies on which landings could be made, while land planes being forced down in the mountainous territory would find practically no safe spot. Mr. Kapteyn spoke of how easily a seaplane line could be operated, for instance, between Chicago and New Orleans, with terminals almost in the hearts of the cities.

Entered by Curtiss in Safe Airplane Contest

CURTISS AEROPLANE & MOTOR COMPANY'S entry in the Guggenheim safe aircraft contest, the Challenger-powered "Tanager," is shown above. The craft is equipped with variable lift devices as well as an N.A.C.A. cowling. Initial tests of the Brunner-Winkle and Handley-Page entries have already been under way at Mitchel Field, L. I., the scene of the competition.

Ten Lincolns to Bennett Firm

KANSAS CITY (MO.)—Ten planes of the Lincoln PT type have been purchased by Bennett Airways, operators of the Bennett Flying School, from the Lincoln Aircraft Corporation, and will be used in student instruction. Delivery of the planes is already underway.

Oil Treating Machine Used by Beazley Firm

MARSHALL (MO.)—Nicholas-Beazley Airplane Company, Inc., has designed and is now using in its factory here, a machine for treating fuselage structure against corrosion, which it claims reduces the time of such a process from 45 min. to 45 sec., and effects a 50 per cent saving in materials.

The deluge treatment is used in supplying oil in a booth, cylindrical in form through which the fuselage, supported by cables from an overhead trolley wire passes. After passing through slots in the booth and being treated the fuselage is suspended over drain troughs which return the surplus oil to the supply tanks.

Perforated tubes inside the booth hold the oil and pressure is supplied by an electrically driven rotary geared pump which can also be reversed to return the oil to the tanks. It is possible to control the pressure in application and to regulate the oil and reducer in getting a proper mixture.

Three-Day Show at Providence

PROVIDENCE (R. I.)—A three-day air show was held Oct. 18-21 at the Newport Avenue field of Curtis Aviation Service, Inc., East Providence.

Colonial, Scully-Walton Plan Ambulance Service

NEW YORK (N. Y.)—Colonial Flying Service and Scully-Walton Ambulance Company have organized what is said to be the first airplane ambulance service in the country. Day and night service between here and any point having an adequate landing field will be provided. Many hours, which often prove the difference between life and death, will be saved by this new arrangement.

Fairchilds, Sikorsky amphibions, and tri-engined Fords will be put at the disposal of Scully-Walton by Colonial Flying Service. On the larger planes, there will be room for relatives and friends of the patients, as well as doctors and nurses.

A national arrangement is now in effect in the following cities to provide ambulance service by plane for those returning to their homes from this city: Atlanta, Ga.; Birmingham, Ala.; Boston, Springfield and Cambridge, Mass.; Chicago, Ill.; Cleveland, Ohio; Indianapolis, Ind.; Memphis and Nashville, Tenn.; Oklahoma City, Okla.; Philadelphia, Pittsburgh, and Wilkes-Barre, Pa.; Portland, Me.; St. Louis, Mo.; and St. Petersburg, Fla.

Titanine Award to Rankin

ELIZABETH (N. J.)—Titanine, Inc., has awarded its prize offered for the best performance of any craft in the 1929 National Air Races at Cleveland with an entirely-Titanine finish to Tex Rankin who finished second in the Portland-Ore.-Cleveland derby. Rankin flew a Taper Wing Waco, powered with a Wright J-6 engine.

Airline Acquired By Schlee-Brock

Connects Twin Cities And Winnipeg, Manitoba

MINNEAPOLIS (MINN.)—Purchase of controlling interest in Canadian-American Airlines, inc., operating air passenger service between the Twin Cities and Winnipeg, has been consummated by the Schlee-Brock Aircraft Corporation of Detroit, Mich.

A new operating schedule, with planes leaving both termini daily at 9 a.m. and making the 450-mi. trip in less than four hours, has been put into effect. Lockheed Vega monoplanes are now used for the service. Approximately $75,000 in new equipment was added to the line by the Schlee-Brock organization.

Although stops are made at St. Cloud, Minn., and Grand Forks and Fargo, N. D., the planes maintain an operating speed of 120 m.p.h. It is planned to equip the machines with skis in the winter. It is understood the line is making plans to bid for the proposed air mail route between Minneapolis and Winnipeg which the Post Office Department is said to be considering. Cities along the route have petitioned for establishment of such service.

Officers of the reorganized Canadian-American Airlines are W. S. Brock of Detroit, president; E. F. Schlee of Detroit, vice-president; H. D. Putnam of Minneapolis, vice-president and general manager; Ralph H. Webb of Winnipeg, vice-president; A. G. Schlee of Detroit, treasurer; J. F. Gould of Minneapolis, secretary, and F. D. Blair of Minneapolis, assistant secretary and assistant treasurer.

Directors include the officers and Eugene S. Shank of Minneapolis, H. C. Schroeder of Shakopee, Minn., Mark R. Hanna of Detroit, and Mason P. Rumney of Detroit.

Pilots on the line are Mr. Putnam, Mr. Shank, Thorwald "Thunder" Johnson and John Grimmett. Fare for the trip is $40 one way and $75 for the round trip.

Aero Country Club Holds Meet

HICKSVILLE (L. I., N. Y.)—One of the initial private air meets of this country was held here Oct. 19 by the Long Island Aviation Country Club. Some two-score craft took part in the show, which was under the direction of Maj. P. V. Burwell, club operations manager. The free-for-all 30-mi. race, in which Eric Wood piloted the low-wing Travel Air "mystery plane" to victory at a speed in the neighborhood of 200 m.p.h., was the feature of the afternoon. Winners in the other events were as follows: Dead stick landing, Maj. Alexander Seversky, Whirlwind Stearman; light plane race, Crocker Snow, Cirrus Avian; Whirlwind plane race, Reginald L. Brooks, Travel Air plane.

A.S.P.A. Medals for Flying Time

NEW YORK (N. Y.)—As an incentive to increase flying, The American Society for the Promotion of Aviation will present a medal to the person flying the greatest number of miles in a year as a passenger and another to the private pilot with the greatest number of solo hours to his credit in twelve months. These presentations have been decided upon by the award committee of the society and will be presented yearly, starting in 1931.

Eastern Aeronautical Acquires General Firm

NEWARK (N. J.)—Eastern Aeronautical Corporation with headquarters at the Metropolitan Airport here has purchased General Aviation Company, operating the Syracuse, Elmira, and Geneva airports in New York State. This was announced by Maj. George A. Vaughn, president of the Aeronautical firm, following a meeting with G. W. Hoyt, vice-president of General Aviation Company, and other officials of both concerns.

At present, there will be no change in the personnel of General Aviation, save augmenting of the Syracuse staff with a Newark man. Sherman P. Voorhees, Elmira, will continue as general manager of the company. Various plane and parts agencies held by the acquired company, will be taken over by the Eastern corporation.

General Aviation Company was enfranchised in March of 1928 by W. Charles Lipe, George L. Sherer, and G. W. Hoyt of Syracuse. To date, some 300,000 mi. have been flown by its planes with passengers and students. It has sold some 30 planes and given instruction to over 50 students.

Tunnel Test Dare Wing Section

ANN ARBOR (MICH.)—Wind tunnel tests to determine aerodynamic characteristics of the Dare variable camber wing section in various positions are being conducted at the University of Michigan under the supervision of Professor F. W. Pawlowski. The tests are being made with a 36-in. span model, one-twelfth the actual size, and technical data obtained will be submitted to the Department of Commerce for an approved type certificate. The model being used was constructed at the University, laminated maple being used. It is possessed of a high polish, and built to permit complete tests of the variable camber section.

Offer First Whittelsey Avians

BRIDGEPORT (CONN.)—First production models of the Whittelsey Avians, American-built Avro Avian, have been placed upon the market by the Whittelsey Manufacturing Company this city. One hundred of these craft are to be completed by early 1930, according to the production plans.

Aero Medical Body Organized in Detroit

DETROIT (MICH.)—Flight surgeons of the Army and Navy and official examiners of the Department of Commerce ended their first convention here Oct. 9. Dr. L. H. Bauer, Washington, D. C., was elected president.

Seventy-five delegates attended the two-day session which was given over to a discussion of various doubtful points dealing with the examination of pilots. Constitution and by-laws of the organization were drawn up and adopted at the closing session. The date of next year's convention was not settled upon. St. Louis will be the city.

The organization was named the Aero Medical Association of the United States. Other officers chosen were: Dr. Ralph N. Greene, Jacksonville, Fla.; Dr. Frederick C. Warnshuis, Grand Rapids, Mich.; Dr. J. R. Poppen, U. S. Navy; Dr. Charles H. Gowan, Glendale, Calif.; Dr. Harold M. Camp, Monmouth, Ill., vice-presidents, and Dr. William B. Smith, Hartford, Conn., secretary and treasurer.

Named as members of the executive council were: Dr. Harold J. Cooper, Washington, D. C.; Dr. Robert A. Strong, New Orleans, La.; Dr. Wade H. Miller, Kansas City, Mo.; Major R. F. Longacre, U. S. Army; Dr. D. S. Brachman, Detroit, Mich.; Dr. Henry B. Dorr, Asbury Park, N. J.; and Dr. John A. Tamishea, Omaha.

William P. McCracken, Jr., first Assistant Secretary of Commerce for Aeronautics, and his three assistants, were given honorary memberships in the association.

Ingalls Leaving for Inspection

WASHINGTON (D. C.)—David S. Ingalls, Assistant Secretary of the Navy for Aeronautics, is scheduled to leave here Oct. 26 for the West Coast where he will make a tour of inspection of the Navy and naval aeronautical activities in that section. He will take a trip on the aircraft carrier *Langley* and also visit the carriers, Lexington and Saratoga at the Navy Yard, Puget Sound, Wash., and various commercial airplane plants. Accompanying the secretary, will be his aide, Lieut. Comdr. R. P. Molten and his pilot Lieut. G. T. Cuddihy, U. S. N. Mr. Ingalls is expected to return here by Nov. 13.

Three More Planes Approved

WASHINGTON (D. C.)—Approved type certificates were issued for the following three planes during the week ending Oct. 19. According to certificate number, make and designation, type, power plant, useful load, and gross weight, they are as follows: No. 254—Travel Air 4-D, three place open biplane, Wright R-760, 1 043 lb., 2 880 lb.; No. 255—Star Model C, two-place closed monoplane, LeBlond 65 hp., 539 lb., 1 400 lb.; No. 257—Waco *CT225*, three-place open biplane, Wright R-760, 923 lb., 2 600 lb.

Draft State Program At Florida Conference

MIAMI (FLA.)—Florida's first Statewide Aviation Conference, held here recently, under the auspices of the Aviation Committee of the Florida State Chamber of Commerce, attracted some 60 aeronautical leaders, representing various flying clubs and chamber of commerce organizations. Conference members endorsed the following undertakings: establishment of an aviation bureau to function as a unit of the Florida State Chamber of Commerce, the launching of an air model contest of state-wide nature in connection with the issuing of an aviation folder and air map, and the holding of a state air tour, following the "All American Air Meet" here in January, 1930.

A. H. Heermance, director of aviation in this city, will head the committee in charge of the Florida Air Tour while Jerome A. Watermann of Tampa will direct the activities of the Air Model Contest group. The State Chamber of Commerce will take immediate steps to expand the State-wide Aviation Bureau and to reach every community in the state.

Among those who spoke at the convention were: Mayor of Miami C. H. Reeder; Traffic Representative Rice of the Pan-American Airways, Inc.; T. E. Caldwell, of Pitcairn Aviation; and Ralph G. Grassfield, general manager of the Florida State Chamber of Commerce. Lieut. E. C. Nilson, of Orlando presided over the business sessions.

Papers Adopt Crash Resolution

ORANGE (CALIF.)—California Newspaper Publishers' Association at a recent meeting here, adopted a resolution respecting the publication of air accident data. As presented by President Justus F. Craemer, it urged that newspapers print the complete facts concerning crashes and that they include if possible, the name and type of plane, whether licensed by Department of Commerce, and whether the pilot and plane were licensed to carry passengers for hire. These questions should be answered, it was held because most accidents occur in either unlicensed obsolete planes or when inexperienced pilots are at the controls.

Russians Stop at Oakland

OAKLAND (CALIF.)—"Land of the Soviets," the plane being piloted by four Russians from Moscow to New York, landed here Oct. 19, after a flight of over 500 mi. from Seattle, Wash., which was their first stop in this county. A faulty oil line had necessitated them making a second start from that city after being forced to turn back after their first departure. Officials, Russian notables and local authorities welcomed the aviators who visited San Francisco shortly after arriving here.

Plan First Alabama Tour

BIRMINGHAM (ALA.)—The first all-state air tour to be sponsored in Alabama is being planned by the Alabama chapter of the N. A. A. Approximately fifteen planes will be entered in the tour, which will be undertaken in the interests of aviation and airports in the state. Nearly every large city in the state will be visited by the fleet.

Govro-Nelson Firm Aequired by Ex-Cell-O

DETROIT (MICH.)—N. A. Woodworth, president of Ex-Cell-O Aircraft and Tool Corporation here, reports the acquisition of Govro-Nelson Company as the first step in a large expansion program. Cylinder sleeves and pistons manufactured by the Govro concern, will add to the variety of parts produced by the tool corporation.

Sales of the Govro Nelson Company for the first seven months of this year, show a 400 per cent increase over the same period in 1928, due, in a large measure to the rapid growth of the aviation industry. Large manufacturers of airplane are at present contractors for 75 per cent of the company's business while orders on hand Oct. 10 were sufficient to insure capacity production at its present plant until June, 1930.

The Govro firm was organized in 1923 to manufacture parts for automobile and aircraft engines, which include crank cases, gear cases, and oil pumps. Electric refrigerator companies and diesel manufacturers have also been among its clientele.

The Ex-Cell-O Aircraft and Tool Corporation will operate the Govro firm as a subsidiary, but the latter concern will retain its own name. Sixty per cent of Ex-Cell-O's business is with producers of airplanes and aircraft engines.

To Test G.E. Magneto Compass

SCHENECTADY (N. Y.)—A magneto compass, product of the General Electric Company will be tested in one of the eighteen-place Boeing transports to be put in service between San Francisco and Chicago. Value of the device on long day and night flights through both clear and foggy weather will be determined. The compass is a remote indicating device using pole pieces which give directional effect and, at the same time, concentrate the lines of force of the earth's magnetic field to produce a dense field in which to operate. The armature used is about the size of a walnut with but a few turns. The average complete installation weighs approximately 12 lb.

To Use Plane in Campaign

NEW YORK (N. Y.)—A plane is to take part in the political campaign here, with the presentation of an airplane to Warner Miller, Republican candidate for Sheriff, by members of the St. Albans Republican Club.

Lindbergh at Paramaribo

COLONEL, MRS. LINDBERGH, and his Excellency Goveroor A. A. L. Rutgers of Dutch Guiana on the occasion of the Colonel's visit to Paramaribo at the opening of that city as the terminus of the new Pan-American Airways Line. The picture was taken following a dinner tendered to Colonel Lindbergh and his party by Governor Rutgers.

Ohio Offers State Compensation

COLUMBUS (OHIO)—The State Industrial Commission has ruled that airplane companies operating passenger planes through Ohio may subscribe to state workmen's compensation for their employes. The decision came as a result of a conference of the commission with R. W. Gwathmey, Washington, attorney for the Transcontinental Air Transport Company. Gwathmey has been visiting every state crossed by the T. A. T. to determine what means may be taken by the company to protect its employes by compensation. The Ohio Commission has no actual power over companies engaged in interstate commerce, according to Thomas M. Gregory, member of the commission, because there is no court decision or act of Congress which designates such power. "But we have adopted the policy of permitting air transportation companies to subscribe, if they wish. We will then recognize meritorious cases," Mr. Gregory said.

Monthly Ryan, Lockheed Rate 12

DETROIT (MICH.)—Twelve planes a month are now being produced at both the Ryan and Lockheed plants of the Detroit Aircraft Corporation, according to Edward S. Evans, president. Mr. Evans stated that he anticipates no important decline from the present production schedule during the winter.

Many New Planes Soon to Be Offered

NEW YORK (N. Y.)—According to reports received here, several new type planes have recently been completed and others are nearing that stage. One of the former is the new high-wing, four-place, cabin plane announced by Powel Crosley, Jr., president of the Crosley Radio Corporation, Cincinnati, Ohio. It is powered with the five cylinder Wright engine and was recently test-flown by Russel O. Wiest. The craft has a 40-ft span and is 26 ft. overall.

A three-place tri-engined plane equipped with Velie power plants, designed by Joe Palmer, is to be produced by Pan-American Corporation, San Antonio, Tex., and will sell for $6,000. In recent trials, Palmer tested the qualities of the plane. It has a gas capacity of 60 gal.

Test flights were recently made in Wichita, Kan., of the new Hilton mid-wing monoplane, by its designer, Ralph Hilton. It uses a 165-hp. Wright engine and will seat four passengers as well as the pilot. With full cantilever wings the plane has a wing spread of 37 ft.

Build Racing Planes

Production has been started by the Superior Aircraft Corporation, Kansas City, Mo., on two racing planes designed by Leo Mohme who formerly constructed racing craft, and now president of the Superior company. The first type which was recently given trial flights, is powered with a 110 hp. Warner. There are 104 sq ft. in the wing surface, which is of the full cantilever design. The wing spread is 24 ft. 6 in. A special under-carriage is made to withstand the shock of a 35,000 lb. load, it is said.

The tri-engined Ogden "Osprey," a six-place cabin plane, is nearing completion in the factory of the Ogden Aeronautical Corporation, Inglewood, Calif. It is to be powered by three American Cirrus engines. In type it is of the conventional braced parasol monoplane, with steel tube fuselage and wood wing construction.

A four-place cabin monoplane with full cantilever wings, will soon be tested by the American Eagle Aircraft Corporation, now adding finishing touches to the plane in their Kansas City, Mo., factory.

Cairns' Fuselage Egg-Shaped

Edmund B. Cairns, Naugatuck, Conn., has designed a low-wing monocoupe with wings over the part of fuselage covering the engine—a four-in-line air-cooled power plant. He has worked out an egg-shaped fuselage with no braces, which is made in three pieces and then welded together. The craft is an all-metal type which he claims, can be produced to sell at a low price. A new control system of push and torque rods does away with the danger of cables jamming or fraying, the inventor asserts. There are no outside control wires, braces, or struts on the Cairns machine.

Hold Meet at Woodward Airport

LEROY (N. Y.)—Races, glider contests, and parachute jumps featured the second annual air meet held Oct. 11-13, at the Donald Woodward Airport here, and attended by some 25,000 persons. In the air derby from Roosevelt Field, L. I., to this airport, Reginald L. Brooks, of New York City, won first prize and also received a silver cup for scoring the highest total for the various events. Among his other victories were the 60 mi. free-for-all race and the 60 mi. race for Whirlwind J-5 engined planes. He flew a Travel Air.

West American Buys Meade and Orr Service

SAN JOSE (CALIF.)—West American Aviation Corporation, Ltd., has purchased the Meade and Orr Flying Service in San Jose, according to H. Z. Peters, president of the organization. According to Peters, the corporation is a newly organized aerial service with a capitalization of $2,000,000. It was formed by a merger of several independent operating units in Sacramento, San Joaquin, and Santa Clara valleys. The organization plans to operate a chain aerial system over this territory and expects to extend its operations from Los Angeles to Portland within a short time. The firm contemplates a complete service, including student training, taxi service, charter plane and airport operation.

It is reported that present operations will include the San Francisco Bay district, San Jose, Sacramento, Modesto, Fresno, Bakersfield and possibly Visalia.

West American Aviation plans to expend about $300,000 in the development of its airports and aerial service. The corporation proposes to operate a feeder line system over the entire chain, connecting prominent cities in central California to the transcontinental and coastal airways operating from the San Francisco district. Reduction in rates on one-way aerial taxi service is planned as a feature of the new service, it is said.

Aileron Modifications Studied

WASHINGTON (D. C.)—By a detailed study of the effect of each airplane aileron separately, the Bureau of Standards, working in co-operation with the Aeronautics Branch and the N.A.C.A., has found that there are certain advantages in a modification of the present control bringing one aileron only to move in the upward direction with the opposite aileron being held in a neutral position. Whether the disadvantages of some additional mechanical complication in operating mechanism, and of increased size or travel of the aileron will outweigh the advantages is a matter of further study. Effect of the shape and size of the ailerons and of the wing section of the plane have been studied for various flying attitudes of the plane.

Aero Branch Seeks Faster Query Returns

WASHINGTON (D. C.)—The Aeronautics Branch recently stated that a delay on the part of airplane manufacturers and others engaged in the aviation industry, in filling out questionnaires sent out by the Department, has resulted in a lack of statistics. The Aeronautics Branch states it only desires these figures for the industry itself and answers will be held in strictest confidence.

The Department's report follows in part: 'The aircraft industry has suffered because of a dearth of authentic information upon its own operations and their trend. Better and prompter commercial statistics therefore if compiled and made available by the Federal Government with the co-operation of the aeronautics industry will largely eliminate this obstacle.

For many years Government surveys have been of material value in bringing facts to the industries concerned. Manufacturers and operators of the aeronautic industry will not only reap a direct benefit for themselves but will assist in the advancement of the industry by answering Government questionnaires carefully and promptly. The Aeronautics Branch prefers that each questionnaire it mails out be signed by its recipient, but if any operator or manufacturer desires not to do this it may be filled out and returned without signature.'

Developing Echo Altimeter

LOS ANGELES (CALIF.)—A sound wave frequency analyzer has been perfected by Prof. Leo P. Delsasso, of the University of California at Los Angeles, for the purpose of analyzing the various sounds emanating from aircraft. Using this instrument, Prof. Delsasso has made hundreds of test flights in all types of aircraft and has succeeded in charting all the noises common to modern aircraft. Now it is hoped that some sound wave may be found which will satisfactorily originate from an instrument on an airplane, travel to the nearest earth or solid obstruction, and echo back to an instrument in the pilot's cockpit in order to register the true distance from ground or obstructions. The Guggenheim Fund for the Promotion of Aeronautics has granted Professor Delsasso $2,000 to help develop an instrument of this type. Professor Delsasso is the inventor of the ocean depth sounding device now commonly used by the United States Navy. He seeks to adapt the same fundamental principles of his nautical instrument to the needs of aviation.

Lockheeds to Mexican Firm

LOS ANGELES (CALIF.)—Receipt of orders for seven Lockheed planes from Commercial Air Transport, of Mexico, and for two additional planes for the Standard Oil Company of New Jersey, have been announced here.

Announce Committee For Baltimore Exhibit

BALTIMORE (MD.)—More than a dozen planes have already been entered for this city's first Annual Aircraft Show which is to be held in Fifth Regiment Armory from Dec. 9-14 under the auspices of the Flying Club of Baltimore with the co-operation of Association of Commerce. Gov. Albert C. Ritchie has appointed Dr. Hugh H. Young chairman of the Maryland State Aviation Commission, head of the show's advisory committee. Mayor William F. Broening is honorary chairman.

The show has been scheduled for December so that it can close a year in which several important additions were made to the city's status as one of the country's outstanding airminded communities. Aviation expansion and development programs underway in this territory at present, eventually will result in expenditures of $50,000,000 in factories, airports, aviation equipment and planes.

Director of the exposition will be Ray Krumm, president of the Maryland Airport Corporation, owner of the new Cumberland Airport. He also directed the Pittsburgh and Philadelphia air shows and is a former newspaper man. Equipment used in these shows will be installed here. The exhibits will be on view daily, from Monday to Saturday from 11:00 a.m. to 11:00 p.m., with special entertainment features being offered during the week. 'Washington Day' will be celebrated with a special program as many Washington exhibits will be entered.

Thirteen Named

Others designated for the committee in charge of the show include Van Lear Black, George J. Clautice, executive secretary, Baltimore Association of Commerce, Carl Fenhagen, Baltimore Trust Company, Edward Handler, president Baltimore Airways,' Inc.; R. C. Hudson president, Baltimore Association of Commerce, Maj. Temple N. Joyce, vice-president, Berliner-Joyce Aircraft Corporation, H. M. Lucius, managing director, Automobile Club of Maryland, Sifford Pearre, vice-president, Equitable Trust Company, D. L. Primrose, secretary, Doyle Aero Corporation; Capt. Townsend Scott, Jr., partner, Townsend Scott & Sons, Major William D. Tipton vice-president Curtiss-Wright Flying Service, General Henry M. Warfield vice-president Flying Club of Baltimore, Benjamin F. Woelper, Postmaster of Baltimore.

Five Comets From Madison Plant

MADISON (WIS.)—The new Madison factory here of the Comet Engine Corporation has completed assembly of its first five engines it was announced recently, by George Johnson, vice-president. On Jan. 1, 25 other power plants are expected to be ready for delivery.

Run By Airplane Stops Run on Bank

TAYLORSVILLE (ILL.)—The arrival of a plane loaded with money and Federal Reserve officers, saved the day recently for a local bank. When the Farmers' National Bank was the only one of the four here to open for business depositors formed a line and began withdrawing their funds. J. J. Adams, president, had supplied the institution for just such an emergency, but when things began to look dark, he sent word for more money. It landed here about two hours later, and the depositor's line evaporated.

Sikorsky Employs 1014 Men

LONG ISLAND (N. Y.)—There were 1014 men on the payroll of the Sikorsky Aviation Corporation Oct. 11, whereas a year ago, the firm only employed 225 employees, a report from the company indicates.

Will Construct Ideco Plant at Houston, Tex.

COLUMBUS (OHIO)—The International Derrick & Equipment Company, of this city, will construct a plant at Houston, Tex., to manufacture flood lights, construct airport buildings and airplane hangars, transmission towers, radio towers and sub-stations for the electric power and light industry, standard steel buildings and oil well equipment. The Texas plant is being erected with a view of locating a convenient point of shipping to the various countries of South America, Africa and Europe, according to Harry M. Runkle, president of the company.

The Boykin Machinery & Supply Company, Beaumont, Tex., which was recently purchased by the Columbus concern, has been reorganized as a subsidiary, and will be known as the International Derrick & Equipment Company of Texas. Officers of the subsidiary will be Harry M. Runkle, president; B. Boykin, Jr., Beaumont vice-president and general manager; Lucien L. Powell, treasurer, and R. R. Bloss, secretary.

Announce NB-3 Improvements

MARSHALL (MO.)—Nicholas-Beazley now offers the NB-3 low-wing monoplane with the Velie power plant. New features of this model include a landing gear especially built to withstand student training usage, an easily-removable engine cowling, inspection plates at all control points, and a worm-type gear stabilizer.

National Glider Week Is Planned

Eighteen Clubs to Observe Anniversary of Association

DETROIT (MICH.)—National Glider Association is making plans to observe its first anniversary by setting aside the week of Nov. 18 as National Glider Week to be participated in by gliding clubs and enthusiasts all over the country. Edward S. Evans, president of the association states that eighteen clubs affiliated with the National body, have been active the past year and inquiries have been received from many states and twenty foreign countries.

Karl Betts, in charge of the expansion program, has made arrangements for prominent aeronautical speakers and authorities to deliver talks in many of the principal cities and have the gliding organizations give public demonstrations wherever possible.

More Than a Sport

"It is the younger generation of Americans who are taking up gliding seriously," observes Mr. Betts. "To them, its chief appeal is that of thrilling outdoor sport, but that is only half of the story. In order to become an expert in the art of motorless flying, a knowledge of the fundamentals of flight and the principles of aerodynamics is essential."

The Germans have taken up gliding and developed it further than any other country because of the limitations imposed upon them by the Versailles Treaty concerning the building of airplanes. They hold the present glider endurance record of fourteen hours, 45 minutes. The present American record is held by Peter Hesselbach who flew his motorless craft 4 hr. 5 min. in the summer of 1928.

Clubs Which Will Take Part

Among gliding enthusiasts and pilots in this country are Miss Amelia Earhart, Col. Eddie V. Rickenbacker, Eddie Stinson and Capt. Frank Hawks, as well as leaders in the aviation industry. The eighteen clubs already organized are: The Albatross Club, Dearborn, Mich.; California Glider Club, San Francisco, Calif.; Dearborn Glider Club, Dearborn, Mich.; The Glider Section of the Aeronautical Society of the University of Michigan, Ann Arbor, Mich.; New York Glider Club, Whitestone, N. Y.; Cleveland Glider Club, Cleveland, Ohio; Cincinnati Glider Club, Cincinnati, Ohio; Breckenridge Glider Club, Breckenridge, Tex.; Seattle Glider Club, Seattle, Wash.; Rochester Glider Club, Rochester, N. Y.; Kansas City Glider Club, Kansas City, Mo.; Jackson Glider Club, Jackson, Mich.; Portland Glider Club, Portland, Ore.; Highland Park Glider Club, Detroit, Mich.; Hillsdale Glider Club, Hillsdale, Mich.; Columbus Glider Club, Columbus, Ohio; Prop & Wing Glider Club, Chicago, Ill.; Cincinnati Girls' Glider Club, Cincinnati, Ohio.

TRADE TIPS

It has been reported that

Danbury, Conn, has appropriated $30 000 for expanding the municipal airport, improving the surface, and constructing hangars

Aero Club of British Columbia is considering the erection of a 40x60 ft. temporary hangar at Vancouver (B.C.) Municipal Airport.

New York Glider Club New York City is planning to secure a glider within the next few weeks and to build a seaplane glider during the winter

Mid-West Aviation Company plans to build a hangar at Des Moines, Ia

Aircraft Industries Ltd, 935 East 14th Street, Oakland, Calif., is taking bids on erection of a plane factory in Modesto, Calif.

New Hanover County Commissioners, Wilmington, N. C., are considering bids for erection of a hangar at the municipal airport, Bluethenthal Field.

Bids on three types of runways for the municipal airport at Indianapolis, Ind., have been asked by the Board of Works. Types specified are concrete base with asphalt top bituminous concrete, and a mixture of asphalt, sand and gravel. The runway will be horse shoe shaped, a 2,500-ft. arm extending east and west, and a 2,100 ft. arm south and southeast.

City Commissioners of Natchitoches, La., have acquired a 160-acre site for an airport and are considering plans for erection of hangars and other suitable buildings

Interstate Iron to Central Alloy

MASSILON (OHIO)—Purchase of the entire property, assets and business of the Interstate Iron and Steel Company, Chicago, by the Central Alloy Steel Corporation here, has been announced through the chairman of the latter organization, F. J. Griffiths. This will bring the total assets of the Central Corporation up to $92,000,000 while the aggregate ingot capacity will be raised to 1,938,000 tons. The concern is planning to considerably expand and develop the Interstate properties and among other features will establish a Western distributing point for Enduro Nirosta, a Krupp stainless material

Du Pont Has Transport Division

WILMINGTON (DEL.)—Organization of a transportation sales department to include aviation, railway and marine activities, is announced by the industrial finishes division of E. I. du Pont de Nemours & Company. Alfred E. Pratt has been named manager of transportation sales with headquarters at Parlin, N. J. Frank H. Crawford and Frank P. Quinn, both to be situated at Parlin, have been appointed eastern manager and district manager, respectively, of transportation sales. The western managership goes to L. M. Ritchie. He will be located at Chicago

Wichita Aero Supply to Johnson

DAYTON (OHIO) — Johnson Airplane and Supply Company announces the purchase of the Aero Supply Company of Wichita, Kan., and will establish a branch store at 531 W. Douglas St., Wichita, where airplane supplies will be sold. The Johnson firm is also stocking its Western branch at 224 E. 11 St., Los Angeles as part of an expansion program.

New Firms Announced

AERONAUTICAL UNITED UNDERWRITERS, INC., New York, N. Y., capital 500 shares of no par-value; by William MacInnes, Maud T. MacInnes, Horace N. Taylor, Leo G. Fritz, Louis Pavelek, to write aircraft insurance.

CORNELIUS AIRCRAFT CORPORATION, Los Angeles, Calif., capital 100 000 shares, by G. Wilbur Cornelius, E. A. Girvin, R. E. Cooney, J. M. Asher, Durwald Bunnell

COLUMBIA FLYING SERVICE, INC., Columbia, S. C., J. A. Mood, president; to deal in aircraft representing Curtiss Wright Flying Service

MASTER AIR-CRAFT CORPORATION, Enid, Okla., capital $250 000, by George H. Arbenz, Alfred W. King, and others.

AERO TRANSPORT, LTD., San Francisco, Calif., capital $100 000, by James Lyle Osborn, Philip T. Holden, William H. Edmonds

G. W. FIELDS, INC., New York, N. Y. (Michigan incorporation), capital 2,000 shares of no par-value; by E. P. Wright, president and others; to manufacture and deal in aircraft

HOUSTON MAIN STREET AIRPORT, Houston, Tex., capital $20 000, by J. I. Huff and others

BLUE RIDGE AIRCRAFT CORPORATION, Asheville, N. C., capital $25 000, by L. Van Proyen, Lloyd Marshall, Max Spurling, Wilson Marsh, C. R. Allison, R. H. Greenwood, to build an airport.

FERRUZZI HYDROPLANE CORPORATION, New York, N. Y., capital 50 000 shares of $10 par value; by Giovanni Ferruzzi, Charles A. Muccioli, Vito La Greca, to manufacture aircraft

ONONDAGA AERONAUTICAL CORPORATION, Syracuse, N. Y., capital 100 shares of $100 par-value, by Benjamin E. Shove, John J. Young, W. Paul Nelligan, to deal in aircraft

SOUTHWIND GLIDERS, INC., Brooklyn, N. Y., capital 500 shares preferred stock of $50 par-value, and 500 shares common stock of no par-value; by Paul M. Dolan, Eugene J. Van Veufern, Francis X. Mullin

Commercial Firm Parts to U. S.

BRIDGEPORT (CONN.)—Commercial Aircraft Company has received an order from the engineering division of the U. S. Government, Dayton, Ohio, for landing gear, cowling, radiator shutters, and other airplane parts.

Ceremony to Mark Laying of ZRS4 Ring

AKRON (OHIO)—Ceremonies attending the laying of the first huge ring in the construction of the ZRS4, giant Navy dirigible, will be held here at the Goodyear Zeppelin Corporation where the craft is being built, on Oct. 31. At that time, officials of the Navy, including Rear Adm. W. A. Moffet, and Government representatives, will be on hand to witness the driving of a symbolic gold rivet into the ring. They will speak later at a dinner given in their honor.

Those expected to be in attendance that evening include Sen. Hiram W. Bingham, Conn.; Governor Myers Y. Cooper of Ohio, Governor Fred W. Green of Michigan, Secretary Jahncke, P. W. Litchfield, president of the Goodyear-Zeppelin Corporation; and chief engineer Dr. Karl Arnstein.

The ZRS4 and ZRS5, being built here for the Navy, will be the largest airships ever constructed, having a 6,500,000 cu.ft. capacity compared with the Graf Zeppelin's 3,700,000 cu.ft. They will be 785 ft. long and 146 ft. high. The ring to be laid, will be the largest one, measuring 133 ft. in diameter and 10 ft. wide. It is built flat on the floor and then hoisted into position

Mackay Cup Awarded

LIEUT. HARRY A. SUTTON receiving the Clarence H. Mackay Trophy from Secretary of War James W. Good at the ceremony in Washington. Lieutenant Sutton was honored with this award for having performed the most meritorious service of any Army pilot during 1928. He conducted dangerous spinning tests of various Army craft having a capacity of about 3,000,000 cu.ft. of gas each, for commercial transport use, by Detroit Aircraft Corporation's Aircraft Development division.

Col. Polan Banks is making an air tour of Europe in the interests of American Aviation Country Clubs.

Lieut. Harvey H. Holland, U. S. Army air corps, has been conferring with E. E. Porterfield, Jr., president of American Eagle Aircraft Corporation, relative to building a single-engined plane to be used in a refueled flight from Manila, P. I., to New York City, via Tokio and Nome, Alaska.

The $400,000 plant expansion program of Ohio Seamless Tube Company, Shelby, Ohio, will be completed by Dec. 1, and will be in operation by the first of the year, according to an announcement by A. C. Morse, president

Licenses to transact business in aircraft insurance and aircraft liability insurance, respectively, have been issued to Continental Insurance Company and Bankers' Indemnity Insurance Company, by the Superintendent of Insurance, Ottawa, Ont.

BRIEFLY

Admiral Moffett has submitted the report of the board selected to examine Pacific Coast sites for a dirigible base, and a decision is expected within a few days.

E. Hamilton Lee, air mail pilot for Boeing System, has 12,740 hr. flying time to his credit, having covered about 1,250,000 mi.

California National Airlines, Ltd., has been formed in San Francisco to operate a general passenger service from Mills Field. The company has purchased a Travel Air six-place cabin monoplane.

The biggest air mail load ever shipped from Buffalo, N. Y., comprised five tons of advertising sent by Fox Film Corporation and American Lithographic Company. The postage was nearly $1,800, and four Fairchild planes were required to carry the load

Dawson-Babcock Aircraft Corporation, Pittsburgh, Pa., distributors for Nicholas-Beazley Airplane Company, has made a standing offer of $100 to any pilot who can hold the Barling NB-3 monoplane in a spin for more than one turn.

Dornier Corporation of America has been incorporated (Delaware) as a subsidiary of General Motors Corporation to manufacture flying boats under Dornier patents

A course of instruction for Varney Air Lines pilots on northwest routes has been started by Capt. W. B. Voortmeyer, who charted the course for Captain Wilkins' north pole flight

West Coast Air Transport recently purchased by Western Air Express interests, has transferred its base of operations from Mills Field to Oakland (Calif.) Municipal Airport. Aero Transport, Ltd. has also moved from Mills Field to Oakland

Hoosier State (Indiana) Automobile Association will establish an aviation division to dispense information concerning airports and flying, particularly within the state

Light-weight radio equipment designed by E. W. Proctor, communications engineer of T.A.T., for installation in the tail of a plane, is being tested by the company. Maximum distance covered by both transmission and receiving is 617 mi

Sale of bonds totaling $150,000 to provide funds for the New Haven (Conn.) Municipal Airport has been postponed until the bond market improves

A 27-page aerial map of Utica, N. Y. in atlas form, has recently been completed by Curtiss Flying Service

Thompson Aeronautical Corporation has ordered two Pitcairn Super Mailwings for use on their air mail lines in Michigan

During September, 1,642 planes checked in and 1,628 planes checked out of airports in Oklahoma City, Okla

Negotiations are under way for the construction of two all-metal dirigibles

AERONAUTICAL CALENDAR

Oct. 31	Discussion of airport paving at Eighth Annual Asphalt Paving Conference, West Baden, Ind., Oct. 28-Nov. 1.
Nov. 7-8	All Western Airport Conference, Los Angeles, Calif.
Nov. 8-13	Inter-Aegate Aeronautic Conference, Columbus, Ohio
Nov. 9-17	Western Aircraft Show, Los Angeles
Nov. 12-13	S.A.E. Aeronautic Meeting, Los Angeles, Calif.
Nov. 18	Lehigh Airport Design Competition Closes, Lehigh Portland Cement Company
Dec. 9-14	Baltimore-Washington Aircraft Show, Baltimore, Md.
Dec. 10-16	National Aviation Week, Mexico, including air show and air display at Mexico City
Dec. 16	Regional Airport Conference for New England, Bridgeport, Conn.
1930	
Jan. 13	S.A.E. Aeronautic Meeting, Miami, Fla.
Jan. 21	S.A.E. Annual Meeting, Detroit, Mich.
Feb. 5-12	New York Aviation Show, auspices Aviators Post, American Legion
Feb. 15-23	International Aircraft Exposition, St. Louis, Mo.
Mar. 6-15	Second Annual Pittsburgh Aircraft Show, Motor Square Garden, Brown Boulevard, Pittsburgh, Pa. Office in Air Club, Pittsburgh William Penn Hotel.
April 5-13	All-American Aircraft Show, Detroit
May 3-10	New York Aircraft Salon, auspices Metropolitan New York Division, Distributor-Dealers Section, Aeronautical Chamber of Commerce, at Madison Square Garden, New York City

AIR MEETS

Oct. 26	Mercer Airport, Trenton, N. J., Federation and races
Nov. 3-7	Air Carnival, Municipal Airport, Omaha, Neb.
Nov. 9-10	At Candler Field, Atlanta, Ga.
Nov. 11	Air Meet, Ranger, Tex. Airport

AIRPORT DEDICATIONS

Nov. 11	Alamosa, Colo. Airport
Nov. 11	Duluth Municipal Airport, Duluth, Minn.
Nov. 15	Curtiss-Steinberg Airport, St. Louis, Mo.
Nov. 15	Kinsolving Airport, Abilene, Tex.
Dec. 4-5	Roswell, N. M., Airport

Forest Firemen Travel in Airplane

GRAND CANYON, (ARIZ.)—An S. O. S. from the Forest Service at Kalispell, Mont., sent twelve trained forest fighters hurrying to the scene on the call in a Scenic Airway tri-engined Ford plane from here.

It left the Flagstaff airport early in the morning and arrived at Kalispell about twelve hours later.

More than 1,000 copies of the New York *Times* were sent to Quebec daily by airplane during the annual convention of the Investment Bankers Association.

Anglum, Mo. post office address of Lambert-St. Louis Field, will be known as Robertson after Nov. 1, in honor of William, Frank and Dan Robertson, pioneer commercial fliers at the airport

Sale of the American Legion hangar at the Municipal Airport, Omaha, Neb., to Rapid Air Lines for $20,000 has been approved by a four to three vote of the city commissioners.

S.A.F.E. passenger revenues for the first fifteen days in October showed a 75 per cent increase over the same period in September

The Navy Department has accepted the design for a flight medal for the personnel of the NC-4 who made the 1919 transatlantic flight, submitted by Miss Catherine C. Barton of Englewood, N. J.

A new Keystone Patrician eighteen-passenger cabin monoplane is undergoing tests at Roosevelt Field.

Century Aircraft Corporation, Chicago, is negotiating for a factory site in Buffalo, N. Y., and plans to move to that city

Guggenheim Foundation has donated $3,750 for the use of Prof. W. L. Everitt, Ohio State University, in the development of a new altimeter.

Canadian Department of National Defence has ordered thirteen Vickers "Vedette" flying boats from Canadian Vickers, Ltd

A race from Kansas City to Mexico City, starting Dec. 10, will be a feature of the Mexican Air week

Recent tests of the mobile mooring mast at Lakehurst under adverse weather conditions have been highly successful

Attempts to refuel an automobile from a plane at Omaha, Neb., failed

Western Airplane Sales Co., Pawhuska, Okla., is planning an airport plant sales agency and air school.

Nepco Airways, Inc., will establish headquarters in St. Petersburg, Fla., Dec. 1, to operate a flying school

Western Aviation Inc., has established headquarters in San Francisco, Calif., at 405 Montgomery Street.

PERSONNEL

COL. V. E. CLARK and COL. THURMAN H. BANE have been elected to the board of directors of The Aviation Corporation. Colonel Clark was chief aeronautical engineer for the U. S. Army from 1915 to 1920, became a member of the National Advisory Committee for Aeronautics in 1916, and is the author of a standard text book on theory of flight. Colonel Bane became chief of the engineering section of the Air Service in 1920, and for the succeeding four years was also commanding officer at McCook Field.

M. R. NICHOL is now district agent in charge of the office of West Coast Air Transport at Seattle. Wash. H. J. MERCHANT has replaced Mr. Nichol in charge of the Portland office.

JOHN CAWLEY, Wausau, Wis., has been appointed private pilot to Gov. Walter Kohler.

R. K. KALTER has been appointed purchasing agent for Spartan Aircraft Company, Tulsa, Okla.

C. R. WARD, formerly with Dallas Aviation School, has been appointed traffic manager for Delta Air Lines, Inc., Love Field, Dallas, Tex.

L. H. LUCKY is now operations manager at the new Curtiss Airport, Dallas, Tex.

M. A. SMITH has resigned from the Materiel Division at McCook and Wright Fields to become chief engineer of propeller activities of Bendix Aviation Corporation, Dayton, Ohio.

KERMIT DONALDSON, production manager, has been named temporary general manager of Alliance Aircraft Corporation, Alliance, Ohio, to succeed the late Aubrey W. Hess.

JESSE DRAPER has been re-elected for a third term as president of the Atlanta chapter of National Aeronautic Association.

B. D. ADAMS, formerly sales and advertising manager of Ryan Aircraft Corporation, has been appointed advertising manager of Detroit Aircraft Corporation.

H. S. TIFFANY is now director of Inter-States Airlines' school at Sky Harbor, Murfreesboro, Tenn. F. F. FRAKES has been appointed sales manager for the Tennessee division of Inter-States Airlines, Inc.

ART MILLS, formerly with Curtiss Flying Service, Oklahoma City, has been made chief instructor for Garland School of Aviation, Tulsa, Okla.

CAPT. JOHN H. MCCAULEY has been placed in charge of sales for Curtiss Flying Service at St. Louis, Mo.

JOHN VAN DER LINDE, who was associated with the preparing of the Spirit of St. Louis for the transatlantic flight, is now chief mechanic at Airtech School of Aviation, Lindbergh Field, San Diego, Calif.

LIEUT. RALPH W. SNOKE, former chief test pilot of the Hartung Airways of Detroit, will be sales representative of the Spartan Aircraft Company for Michigan, Indiana, Ohio, and Western Pennsylvania. C. L. HUSSEY, formerly with Aeronautical Distributors, Inc., of Los Angeles on the Pacific Coast. DAN FOWLIE, for Minnesota, Wisconsin, Illinois, and part of Iowa.

CY CALDWELL has joined the flying staff of Cessna Aircraft Company, Wichita, Kan.

RALPH S. MAUGHAN, JR., is now Montreal district manager for Canadian Colonial Airways.

I. W. C. SOLLOWAY has been elected president of Commercial Airways, Ltd., Edmonton, Alberta.

JOHN PAHL has been appointed assistant airport manager at the Akron (Ohio) Municipal Airport.

RYAL MILLER has been elected president and general manager of Kari-Keen Aircraft Company, Sioux City, Iowa. MERLE F. CORNELL is now sales manager. DR. B. H. SPRAGUE, retiring president, will retain his interest in the company.

E. J. MOHR has been appointed manager of industrial sales for The Gumite Corporation, Rockford, Ill., manufacturers of special steels.

MISS ZORA KORITNIK has been appointed air traffic representative of Universal Aviation Corporation of St. Louis. TOM BATSON succeeds ROY D. MOTE, transferred to the same position at Cleveland as assistant sales manager of the St. Louis school.

J. F. FURLONG has been promoted to assistant traffic manager of Central Air Lines, division of Universal Air Lines, with headquarters at Wichita, Kan.

WALTER H. DAVIS has been appointed production manager at Bach Aircraft Company's plant at Los Angeles Metropolitan Airport.

AUGUST LEAZER has been appointed operations manager for the Curtiss Flying Service Airport at Raleigh, N. C.

M. A. DAWSON has been appointed chief pilot for Sullivan Aircraft Company, Wichita, Kan.

Representatives Named

BABLING NB-3—Dungan Airways, Inc., Cleveland, Ohio, distributors for Ohio. Weiant Aircraft Sales Company, Newark, Ohio.

B. G. SPARK PLUGS—Great Northern Aviation Corporation, St. Paul, Minn., for Minnesota, North and South Dakota, Wisconsin.

CAVALIER—Northern Indiana Flying Service, Goshen, Ind.

SPARTAN—C. T. Eastman, Oakland, Calif.; for California, Nevada and Oregon.

TRAVEL AIR—Skyways, Ltd., Toronto, Ont., for Ontario.

WACO—New York Aircraft Distributors, Inc., territory extended to include northern New Jersey.

Schools & Colleges

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Boston, Mass., is offering five university extension classes in aviation. This is the beginning of a three year aeronautic instruction program arranged by the division of university extensions of the Massachusetts Department of Education, in co-operation with Prof. Daniel C. Sayre of the Institute of Technology.

CURTISS-WRIGHT FLYING SERVICE will open a school at Lawrence, Kan.

INTERSTATE AIRLINES, INC., opened a school at Tennessee Sky Harbor, Murfreesboro, Oct. 1.

AKRON MUNICIPAL AIRPORT will have a lighter-than-air institute as a result of a $100,000 bond issue recently voted by the Akron (Ohio) Council.

UNIVERSITY OF WASHINGTON, Seattle, will open a school of aviation next fall when the $290,000 building, given by the Daniel Guggenheim Fund, is completed.

ST. JAMES AIR COLLEGE has been opened at St. James, Mo., with G. A. Morris, president. Daniel Mitchell, secretary and treasurer, Lieut. Anton A. Yotz, general manager.

SYRACUSE UNIVERSITY, Syracuse, N. Y., offers a course in aerial photography and surveying. Carl S. Busch, J. B. Beadle, Col. Claude H. Birdseye, Sherman M. Fairchild and Capt. E. S. Land will serve as an advisory committee to Dean Louis Mitchell of the College of Applied Science.

ROOSEVELT AVIATION COLLEGE, 119 W. 57th St., New York, N. Y., was opened Oct. 7 by Roosevelt Aviation School.

NATIONAL AIRWAYS, INC., Detroit, Mich., has opened a training school at Ann Arbor.

UNIVERSITY OF WICHITA (Kan.) Engineering School is completing a wind tunnel to be used for experiments in connection with the four-year course in aviation engineering.

CURTISS-WRIGHT FLYING SERVICE reports a total of 5,321 hr. flown by students during September at its various branches, the largest total for any single month this year. A fleet of 343 planes was used in the company's operations.

UNIVERSITY OF SOUTHERN CALIFORNIA has 175 students enrolled in the classes in commercial aviation, airport management, airplane power plants, theory of flight, and meteorology and air navigation.

CENTRAL TECHNICAL SCHOOL, Toronto, Ont., co-operating with Toronto Aero Club and DeHavilland Aircraft Company, has enrolled more than 250 students in its evening classes, and has been forced to turn many away.

GREAT NORTHERN AVIATION CORPORATION plans to establish a school at the Municipal Airport, Duluth, Minn., in addition to its school at Pike Lake Airport there.

AIRPORTS AND AIRLINES

Moves to Provide More Federal Control

WASHINGTON (D. C.)—Senator Bratton of New Mexico impressed by the disaster of T. A. T.'s City of San Francisco, has asked for a Senate investigation of recent air crashes. His resolution embodying this request was held up by Senator Bingham of Connecticut and other Senators who do not believe that any good purpose would be served by a general investigation of the aviation industry. Due to the anxiety of senate leaders to expedite passage of the tariff bill, a resolution for such an investigation as Senator Bratton proposes cannot be referred to a committee as long as there is objection.

Senator Bratton has gotten around this situation by bringing out a bill on Oct. 14 providing for complete regulation of interstate air traffic by the Interstate Commerce Commission. A bill does not share the same fate that a resolution does but may be referred automatically to a committee. Thus the bill will be submitted to the Interstate Commerce Committee of the Senate and immediate and exhaustive hearings are promised. Senator Bratton is particularly out of sympathy with the Department of Commerce policy of refusing to make public complete reports of air accidents.

T. A. T. and other air lines conduct joint service with rail carriers which report to the Interstate Commerce Commission. Senator Bratton believes therefore that these air carriers should be regulated by the same agency that regulates the rail carriers which participate with them in the joint haul. Senator Bratton's bill is long and complicated. Its main features provides that the Commission shall exercise its control through the issuance of certificates of public convenience and necessity and that rates and schedules shall also be regulated. The bill further provides that no company shall limit its liability for personal injury or death or exempt itself from such liability. Maximum liability of surety companies in indemnity bonds is fixed at $10,000.

The general attitude of the aviation industry toward the idea of interstate Commerce Commission supervision is characterized by extreme opposition.

Arkansas Aids Airport Project

LITTLE ROCK (ARK.)—The help of state highway department machinery and the advice of the state highway commissioner are available to the communities in this state in problems of airport construction according to a ruling passed by the legislature. Encouragement in airmarking is given also.

Open Portland Radio Unit

PORTLAND (ORE.)—Radio communication between planes and ground was inaugurated here recently when the $25,000 government radio airway communication station on Fisher Road was placed in operation. The station is in charge of W. E. Cutting signing KCY. This is the fifth station now in operation on the Coast.

Plan Southwestern Mail Route Discussion

WASHINGTON (D. C.)—A hearing on the much-discussed southwestern transcontinental air mail line has been announced by Assistant Postmaster General W. Irving Glover for Nov. 25 at 10 a. m. in the conference room of the Post Office Department. The Inter-Departmental Committee on Airways holding the hearing wishes to get first-hand information from all interested parties, and is opening the hearing to all those advocating a southwestern route.

One route suggested runs from St. Louis via Tulsa, Fort Worth and Dallas to Los Angeles. Another suggestion is for the extension of the existing Atlanta-Birmingham line to Fort Worth and Dallas and thence to Los Angeles. A third proposal contemplates a more southern route, linking New Orleans, Houston, San Antonio, El Paso, San Diego and Los Angeles. Southern Air Transport lines already are carrying mail, or have contracted to do so along part of the latter two proposed routes their present lines running Atlanta-Birmingham-New Orleans and New Orleans-Houston-San Antonio. The committee held one conference on this project Aug. 1.

Push Plans for Hog Island Port

PHILADELPHIA (PA.)—Speedy action toward the acquisition and development of Hog Island as a municipal airport was promised by the City Council acting upon an extensive recommendation submitted by Mayor Mackey. As soon as the approval of the Council is secured, Representative George P. Darrow will ask Congress to authorize the sale of the island to the city. It is improbable that there will be any serious objection to the sale, and the development plans which have already been drawn up may be put into effect within a comparatively short time.

To Open N.Y.-Pittsburgh Line

PITTSBURGH (PA.)—A new passenger line from Pittsburgh to New York and Philadelphia is expected to be established by the Pittsburgh Airways, Inc., Nov. 1.

Mail Problem Puzzles Conferees

Kelly Recommends That Short Routes Be Extended

WASHINGTON (D. C.)—Conferences between Post Office Department officials and representatives of air mail contract routes were adjourned from Oct. 14 to Oct. 24, due to continued failure to agree on a satisfactory formula. It was reported that after the contractors had admitted their inability to agree on a suitable 'yardstick,' one was tentatively proposed by the Post Office Department, but strenuous objections to it were made by Post Office officials as well as by the contractors and efforts to reach an agreement will be continued.

In addition to the problem of determining the relative importance in fixing rates of night and day flying, length and terrain of routes, and differences in types of planes used other 'variables' are being taken into consideration which are being kept secret for the present. They are said to include such points as wind and weather conditions and wages for pilots.

Individual Conferences Encouraging

Hope for an early solution is seen, however, in the announcement that the Interdepartmental Committee on Civil Airways, representing both the Post Office and Commerce Departments, is planning an early meeting and the future work of the Committee will have to be based on the outcome of the present controversy. Aside from the general conferences which were temporarily broken off, the committee headed by Second Postmaster General W. Irving Glover has been meeting representatives of the various transport companies separately, and in this way considerable progress is said to have been made.

In the meantime, Representative Clyde Kelly, author of the Air Mail Act of 1926, has indicated his intention of introducing legislation authorizing the Postmaster General to extend existing air mail routes up to 400 mi., with the probability that some of the shorter routes which cannot be suitably extended may be abandoned when present contracts expire. However, in an exclusive interview with AVIATION'S Washington correspondent, Mr. Glover said that no action to eliminate the short routes would be taken until a formula for rate reduction has been found and if extension of routes is authorized it is possible that none would be discontinued.

All Western Airport Conference Nov. 7-9

Young, Blee, Will Speak At Los Angeles Meetings

LOS ANGELES (CALIF.)—An All-Western Regional Airport Conference will be held here Nov 7-9, under the auspices of the Airport Section of the Aeronautical Chamber of Commerce Robert J Pritchard, Los Angeles, is chairman of the committee on arrangements, whose members are J D Woods, Boise, Idaho E. A. Johnson Dayton, Ohio Waldo Waterman and Woodruff DeSilva Los Angeles, Harry L. Finch, Salt Lake City, Utah L H Larson, Tacoma, Wash William H Mallon, Aeronautical Chamber of Commerce, New York City, is executive of the conference Inquiries should be addressed to Airport Section, 10 East 40th Street, New York City The last day of the conference coincides with the opening of the Western Aircraft show here

Plan Elaborate Program

The program for Nov 7 follows 9 00 a m , Registration, Hotel Alexandria, 10 00, Address of Welcome Mayor Porter, Response and Keynote Speech, Col. H H Blee 11 00 "Standardization of Airport Traffice Regulation," David C. Logg, Manager Boeing Field, Seattle, Wash , 12.30 p.m. Luncheon Session William Fox toastmaster R. R. Fisher speaker appointment of committees on revenue standardization traffic regulation standardization marketing the airport airport accounting, 2 00, "Who Should Build Airports?" Hon J D Wood commissioner of public works, Idaho 2 45 "Marketing the Airport," Woodruff DeSilva, acting director of airports Los Angeles, 3 15, "Relation of Aircraft Operators and Airport Management," Waldo D Waterman, general manager, Los Angeles Metropolitan Airport 3 45 "Airport Accounting," A P Taliaferro Jr. 4 30, "Is the City Entitled to a Profit?" Milo Kent, chairman airport committee, San Francisco 5 00 adjournment. Committees will hold sessions during the evenings

At 8 30 a m , Nov 8 members of the conference will go by bus to Los Angeles Municipal Airport for an inspection tour At 10 00, in the municipal hangar, Duff Wilson, manager of Clover Field will deliver a paper on "Operators' Associations," to be followed by general discussion The morning session will be adjourned at 12 15, and a luncheon session will be held in Curtiss Hangar with C C Spiker as speaker At 1.30 p.m , members will leave by bus for Western Air Express Field, where the afternoon session will be called to order for general discussion at 2 30 in the Hexhangar Reports of committees will be presented at 4:00, followed by adjournment at 5 00 A banquet will be held at 8 00, with Maj Clarence M. Young and Col H H Blee as speakers

On Nov 9 members will leave by bus at 8 45 a m for inspection of Grand Central Air Terminal, Metropolitan Airport and United Airport, returning to city for luncheon at Hotel Alexandria 12 30 p m. At 2 00 there will be an official reception at All-Western Aircraft Exposition with an address of welcome by Fred Worthey Lighting equipment will be demonstrated at 7 00 p m

Start Gulf-Lakes Line Oct. 28

CHICAGO (ILL.) — Illinois Central Railroad and Continental Air Services, Inc, have arranged for the Great Lakes to Gulf air-rail service, to start Oct. 28 according to J V Lanigan, passenger traffic manager of the railway concern About five Travel Air cabin planes will be used between Chicago and Memphis, and a number of Keystone-Loening amphibions will be flown between Memphis and New Orleans. Stops also will be made at St Louis and Vicksburg

Hold Regional Airport Conference in Atlanta

ATLANTA (GA.)—Sponsored by the Aeronautical Chamber of Commerce of America, the first Southern Airports Conference was opened Oct 14 at the Atlanta-Biltmore Hotel The first session was given over to addresses by leaders in southern airport development, including addresses on "The Planning and Development of the Municipal Airport," George W Foster of Love-Sultan, Inc St Louis Mo , "The Civic Club and Its Function in an Airport Planning Program," Hub Hahn president of the Junior Chamber of Commerce, Birmingham Ala , "Management Methods of the Miami Airport" Andrew H Heermance director of aviation for Miami Fla , "Uniform Service and Service Charges at Airports," William H Mallon, manager of the Airport Section of the Aeronautical Chamber of Commerce

The addresses were followed in the afternoon by a session devoted to questions and answers, dealing with the planning development and operation of municipal airports

Several hundred people attended the meeting which was presided over by Alderman William B Hartsfield chairman of Atlanta's aviation committee T W McAllister editor of "*Southern Aviation*" served as chairman of the arrangements committee

Curtiss Schools Report Activity

NEW YORK (N. Y.)—September was the most active month of the year for students in Curtiss-Wright Flying Service schools, with a total of 5 321 hr. of flying The total revenue hours flown by the 343 company planes in service was 7 458, and 14 784 passengers were carried without a fatality Aerial tours consumed 1,096 hr , while scheduled flights charters photographic division and miscellaneous flying accounted for 1,037 hr., according to the report issued by Maj E. H Brainard.

Airport Conference Under Way at Capitol

WASHINGTON (D. C.)—Engineers and city officials of the American Road Builders' Association who are interested in the building of airports met with members of the Aeronautical Chamber of Commerce in a Municipal Airport Conference Oct 24-25 Among the principal speakers were Assistant Secretary of War F Trubee Davison, Assistant Secretary of the Navy David S Ingalls, Assistant Postmaster General W. Irving Glover, Senator Hiram Bingham, and Frederic A Reimer, president of the American Road Builders' Association

The program of technical speeches Oct 24 was as follows "Airport Layout and Planning," B Russell Shaw, "Airport Structures," Kenneth Franzheim, "Airport Drainage," C. A Hogentogler In the evening Maj Gen John F O'Ryan spoke on "The Commercial Future of Aviation"

On Oct 25 the subjects and speakers were "Airport Surfaces" C N Conner "Airport Management," A P Taliaferro, "Airport Progress" N E Duffy "Airports and Public Parks" Lt Col U S Grant, "European Practices," Col C M Young Col H H Blee presided over the meetings on both days Charles M Upham was toastmaster at the banquet in the evening of Oct 24 A full report of the Conference will be published in AVIATION next week

Testing Armstrong Seadrome

CAMBRIDGE (MD.)—Extensive tests of a model of his proposed giant seadrome for use in trans-ocean air transportation are being carried out in the Choptank River here by E. R Armstrong inventor of the device During a squall, waves 18 in high were said to have passed through the structure which supports the landing platform without breaking Inasmuch as expectations of stability of the seadrome in rough weather are based on its ability to ride heavy waves without causing them to break it is considered that the tests are working out satisfactorily Other tests are reported to indicate that the engineering calculations developed for the device are proving to be correct

N.Y. Groups Plan Airship Lines

NEW YORK (N. Y.)—Two groups interested in trans-ocean airship transportation are making active plans for promotion of that form of air travel it has been disclosed here recently One is known as the International Zeppelin Transport Company and is backed by the National City Bank of this city The other is considering a trans-Pacific operation and involves a number of large financial houses, including Lehman Bros , Pynchon & Company and Harriman Brothers & Company Further details are expected to be announced soon

S.A.F.E. Reduces Rates

TULSA (OKLA.)—New schedules and reduced rates were put into effect Oct 15 by Southwest Air Fast Express The service between Tulsa, Okla , and Oklahoma City has been increased to three trips daily each way, and the new schedule over the route from Dallas and Fort Worth, Tex , to St Louis Mo , calls for earlier departures from the southern cities Baggage limit has increased from 25 to 30 lb with excess figured at one-half of 5 per cent of fare per pound, up to 50 lb The fare from Dallas to Tulsa is now $24 for the 240 mi , and from Fort Worth to St Louis it is $60

S.A.T. Reports Operations

FORT WORTH (TEX.)—The three passenger lines of Southern Air Transport are reported to have carried about 3,400 persons during the first six months of operation. The planes traveled 724,475 mi There was not the slightest injury to any passengers, it is claimed The company recently opened a radio broadcasting station, designated as KTAT, operating on a wave length of 241 8 m. Programs are being broadcast in the general interest of aviation The station and towers are located several miles north of the local airport

Start Denver-Kansas City Line

DENVER (COLO.)—Midcontinent Air Express, which inaugurated service recently between this city and Albuquerque, N M, and El Paso, Tex , has started a third line, to Kansas City, Mo Flying time is 6½ hr , with stops at Colorado Springs, Pueblo La Junta Holly, Syracuse Dodge City, Wichita, Emporia and Topeka Six-passenger Fokker Universal planes are used, and one trip is made daily in each direction

Movies Shown In T.A.T. Planes

COLUMBUS (OHIO)—Motion pictures for the entertainment of airline passengers have been successfully demonstrated on a Transcontinental Air Transport plane by Universal Newsreel Company and the Duograph Company, makers of the special projector used. The apparatus with its batteries weighs less than 34 lb., and projects pictures on a screen 20 x 24 in hung behind the pilot's cockpit. It is planned to show the pictures as a regular daily feature of T A T service, with newsreels and comedies changed twice weekly

Kelly Field Record Established

SAN ANTONIO (TEXAS) — During August the record of flying time at Kelly Field was the greatest for any one month since the War Pilots in the Pursuit, Attack, Observation and Bombardment Sections flew 6,207 hr 40 min , while students at the Air Corps Advanced Flying School Flew 4,253 hr 40 min.

Varney Using Boeings on New Line

SALT LAKE CITY (UTAH)—Varney Air Lines has acquired a third Boeing 40-B4 mail plane for use on its new Salt Lake-Portland service. These machines are powered with Hornet engines and carry four passengers in addition to the cargo of air mail

Air Mail Statistical Report for August, 1929

ROUTE Number and Termini	Length of Route (Miles)	Frequency (Rd Trips per Month Scheduled)	Miles of Service Scheduled	Miles of Service Actually Flown	Total Weight of Mails Dispatched (Pounds)	Amount Paid to Contractor
1 Boston-New York	192	72	12,480	12,114	13 123	$39,359 56
2 Chicago-St Louis	278	92	34 250	34 230	8,220	20 509 24
3 Chicago-Dallas	1 059	92	174 960	174 479	41 666	124 997 81
4 Salt Lake City Los Angeles	910	58	69 600	99 600	69,505	209 315 75
5 Salt Lake City-Pasco	530	31	32,860	32 860	20,344	91 033 12
8 Seattle-Los Angeles	(a) 1 141	31	93 631	63 831	25,222	71 499 96
9 Chicago-Minneapolis	503	93	79 143	78 970	24 839	92 256 36
11 Cleveland Pittsburgh	123	92	15 252	13 669	6,772	28 314 87
12 Cheyenne-Pueblo	199	31	15 405	13 405	10,402	8,633 45
16 Cleveland-Louisville	343	92	44,454	44 592	11 088	13 529 83
17 New York-Chicago	718	92	127 961	122 552	195 335	126,314 07
18 Chicago-San Francisco	1 932	30	232,318	232,318	199 314	353,969 14
19 New York-Atlanta	763	31	58 199	52,893	34,037	102,112 12
20 Albany-Cleveland	449	27	33 942	33 199	9 805	10 894 04
21 Dallas-Galveston	320	31	19 984	19 984	3 973	10 616 23
22 Dallas Brownsville	529	31	32 798	32,798	7 490	21 949 28
23 Atlanta New Orleans	483	31	29 946	29 277	6,507	14 853 09
24 Chicago-Cincinnati	270	93	52,119	52,009	6,510	12,503 98
25 Atlanta-Miami	739	31	43 932	45 420	[illegible]	14 309 03
26 Great Falls-Salt Lake City	489	31	39 432	39 452	7 550	18 956 44
27 Bay City-Chicago	773	31	60 525	59 547	23 854	21 230 36
28 St Louis-Omaha	403	31	24 986	24 608	5 924	4 414 34
29 New Orleans-Houston	319	31	19 778	19,778	4 200	4,200 12
30 Chicago-Atlanta	768	31	47,616	47,616	9 137	7,123 35
31 Chicago Municipal Airport Grant Park Ramp Chicago	9	31(b)	279	225	5 547	375 00
Totals	15 928	[illegible]	1,312,688	1 308 184	781 530	$1 361 619 24

(a) Southbound trip not operated between Seattle and Portland
(b) One-way trips

(NOTE—Close comparisons between the various air mail reports issued from time to time will reveal slight discrepancies in various figures. These are not errors strictly speaking but are due to various readjustments which have to be made from month to month after the previous figures have been released —Editor)

Canadian Air Mail Shows Great Gains

OTTAWA (QUE.)—Air mail in Canada has increased by leaps and bounds during the 21 mo the services have been operation, it was disclosed in a recent report The salient figures through August of this year are as follows

Date		Miles Scheduled	Miles Flown	Mail Poundage
Dec	1927	1,101	872	2,250
Jan	1928	2,030	1,686	9 394
Feb	1928	3,732	3 212	15,694
Mar	1928	3 768	3,768	15,283
Apr	1928	3,448	3,606	8,505
May	1928	15,060	13 793	22,792
June	1928	15 736	14 090	27 074
July	1928	16 949	12,146	23 582
Aug	1928	15 375	12,979	29 804
Sept	1928	19 372	14 812	31 379
Oct	1928	33,919	31 392	32,497
Nov	1928	26,850	22 560	17 240
Dec	1928	24 750	24 824	21 879
Jan	1929	30 750	32,917	25 200
Feb	1929	32,244	43 961	39 228
Mar	1929	47 692	45 463	59 592
Apr	1929	26 287	24 714	23 419
May	1929	36,129	50 120	23 380
June	1929	38,045	32,193	37 289
July	1929	40 728	43,601	39 642
Aug	1929	37 492	57 102	41 738
Totals		503 704	509 385	552,293

The poundage carried during May, June, July and August by routes was as follows

Narrow Lake-Sioux Lookout—May 3 494 June, 7 687 July 7,603 August, 7,912

Cranberry Portage-Kississing—May none, June, 5,777 July 4 067, August 4,592

Hecett-Lac du Bonnet—May 2,979, June, 2,056 July 2,860 August 3,336

Special flights from Manetee—July, 573

Montreal Rimouski—May 12,044; June, 11,266 July 10,607 August, 11 360

Montreal-Ottawa—May 231 June 399 July, 749 August 551

Montreal-Albany—May, 1,071, June, 1 594; July, 2,107 August 2 550

Montreal Detroit—July 3 493 August 3,119

Montreal Toronto—May 2 992 June, 2 863, July, [illegible]

Toronto-Buffalo—July, 3,290, August, 3,314

Special flights from Hamilton to Toronto—June 345

Totals—May, 23 380 June, 32 289 July 36,042 August, 41 738

Daily average—May 899 June, 1 241 July 1 409, August 1 609

Omaha to Have Air Mail Week

OMAHA (NEB.) — From Oct 28 to Nov 2 has been designated as Air Mail week here by the Junior Chamber of Commerce Many publicity features and special contests have been arranged to arouse interest in air mail and so to promote aviation in Omaha Among them are the use of special car cards, radio programs, newspaper advertising, speakers for luncheon clubs and schools stamp sales contest for children and a special essay contest for women stenographers Prizes will be free plane rides

Cut Portland-Los Angeles Time

PORTLAND (ORE.)—Mail and passenger service over the Pacific Air Transport (Boeing System) route from this city to San Francisco and Los Angeles has been speeded up for the second time in three months The new schedule is 9½ hr. to Los Angeles, 2 hr 15 min. less than before Hornet engines have recently been installed on the planes used.

AIRPORT CONSTRUCTION PROJECTS

THE DULUTH, MINN. City Council has authorized Leonard Macomber Inc. Chicago to prepare plans for the development and operation of the municipal airport, the plan of operation to include estimates of cost and possible revenue, etc.

All engines destined for T A T transport planes will be tested on a new $5,000 test stand, recently completed at Port Columbus. It is housed in a brick building about a quarter of a mile north of the T A T. hangar.

Two steel 200 x 250 ft. haugars costing about $65,000 each have just been completed at the United Airport, Burbank, Calif. The Northrup Aviation Corporation factory at the field is ready for occupancy, while the administration building, several minor buildings and the servicing and experimental plant of the Hamilton Propeller Company are partially completed. It is expected that the field will be dedicated in its complete form about the first of next year.

Arrowhead - International Airways, operating a passenger line between Duluth and Port Arthur Canada plans to build a six-plane hangar at the Duluth Municipal Airport.

Telegraph Printer for Moline

N.A.T. is installing a simplex telegraph printer at the Moline (Ill.) Municipal Airport. It is reported that the Curtiss Wright Flying Service will begin extensive improvements at the Moline Airport as soon as an agreement regarding lease for the field has been consummated.

Iowa City, Ia., will begin construction soon of a municipal airport according to plans of the Leonard Macomber company. The project is to be financed by a $70,000 bond issue approved last spring.

A beacon on a 75-ft. tower at the southeast corner of the 160-acre Joliet (Ill.) Airport has been authorized.

Martin Airport Corporation of Portland, Ore., has leased 100 acres of the Ruby stock farm, five and one-half miles east of the city, for the development of an airport to be one of a proposed chain which already includes fields at McMinnville and Hillsboro, Ore.

The Asheville-Hendersonville Airport near Asheville, N. C., has been leased from its former owner T. J. Roberts, by the Asheville Chamber of Commerce. Improvements costing about $30,000 and to include installation of drainage system, lighting, runways and other developments will be undertaken. Negotiations are now in progress involving lease of the airport from the Chamber of Commerce for five years by the Pocahontas Air Transport Corporation, of Bluefield, W. Va.

Considerable progress has been reported of the new construction of the Kansas City (Mo.) Municipal Airport. The Bredouw-Hilliard Aeromotive Corporation building is receiving finishing touches and the passenger station is being pushed to completion. The Butler Aircraft plant being erected in several units has reached a stage where manufacturing has been started in one unit.

An aviation committee has been appointed at Nashville, Tenn., to select a site for an airport.

The Curtiss Wright Flying Service has called for bids on the construction of its second hangar at the Los Angeles Municipal Airport, formerly known as Mines Field. The first hangar is now in use. The new hangar will cost $55,000 and will measure 142 x 143 ft. It will be of steel and hollow tile construction with corrugated iron and tile roofing and concrete floors.

Montgomery, Ala., Completes Port

Construction has been completed at the Montgomery (Ala.) Airport. Extension of its present building is planned to be carried out on the side away from the airport so that future developments will not interfere with the present airport surface.

Buffalo is planning to improve its municipal airport at a cost of between $500,000 and $700,000 next spring. New equipment will include additional hangars, 600-ft. streets and additional parking space for motorists.

Lighting equipment is being installed at the Victoria (Tex.) Airport on the Houston-Brownsville federal airway.

Plans are being made for an airport at Bainbridge (Ga.) under the auspices of a group of business men.

Rutledge Air Service Ltd., of Calgary, Alberta has placed a contract for a hangar and office building at the Calgary City Airport. The building will measure 80 x 100 ft. and will cost $15,000. Great Western Airways is considering a similar hangar at the Calgary airport.

Alexander to Build Hangar

A second hangar 600x100 ft., which will house ten or twelve light planes, is being erected at a cost of $12,500 by the Alexander Aircraft Company at the Alexander Airport, Colorado Springs.

Contract has been let by the Aircraft Industries Ltd. for an airplane service and repair plant at Portland (Ore.) Airport.

The civic airport committee of the city council of Vancouver, B. C., has purchased options on 459 acres of Sea Island, fronting on the mouth of the Fraser River, as a site for the permanent city airport. The price of the property is approximately $250,000 and a bylaw for $200,000 will be submitted to ratepayers on Dec. 11 to provide for improvements. The first airport bylaw for $300,000 was passed last year.

Double runways, one for taking off and another for landing, are under construction at Alameda (Calif.) Airport. Experiments made with several surfacing materials has developed the fact that one type of surfacing is desired for taking off while an entirely different type of field is required for landing planes, according to R. R. Nickerson, airport superintendent. For taking off, a shell foundation proved most satisfactory in tests, while the field with an oiled surface was found safest for landing planes. As a result of the tests, an area has been set aside at the port for planes taking off, and that area will be surfaced with a composition containing principally crushed shell.

Mid-West Aviation Company with headquarters at Omaha is planning to build a hangar at Des Moines similar to the one located at Omaha Municipal Airport. The company has a flying school at Des Moines and another at Omaha.

A $30,000 landing field site has been purchased by the recently organized Montpelier-Barre Airport Company at Berlin, Vt.

Plans for an airport layout and accessory buildings to be erected on the Boston Post Road in Milford, Conn., are being prepared by Leo F. Caproni, consulting engineer of 1056 Chapel Street, New Haven. Three main buildings, for administration, hangar and club purposes, will be erected, the estimated cost being $100,000. The plans will be completed about Nov. 1.

Quincy, Ill., Buys Tract

A tract of 460 acres, three and a half miles west of Memorial bridge, Quincy, Ill., has been purchased by a committee representing the Quincy Chamber of Commerce and will be improved as an airport during the winter and spring. The tract will be filed this winter, sodded in the spring to provide proper field and the chamber proceed with further plans to lay out a proper landing field and provide adequate airport facilities.

Work has begun on erection of the hangar of the Lincoln Flying School, Lincoln, Neb., which will be large enough to take care of eighteen or twenty practice planes.

The Greenbriar Hotel interests of White Sulphur Springs, W. Va., has purchased The Meadows, an adjoining estate, and will at once establish an airport thereon.

Gen. H. H. Howard has just begun construction of a hangar for the National Park Airways at Pocatello, Idaho.

Improvements undertaken by Santa Monica, Calif., at Clove Field have been completed.

Airport Dedications

Tennessee Sky Harbor, serving both Murfreesboro and Nashville, Tenn., was dedicated Oct. 14 the day of the visit there of the National Air Tour fleet. The all-way field has a heavy turf surface, is free of boundary obstructions and equipment includes a large steel, brick and glass hangar and an administration building which includes a restaurant. The field is lighted.

Among the other airports dedicated recently are those at Kremmling, Colo.; El Paso, Tex., for Standard Airlines; Conneaut, Ohio; Punxsutawney, Pa., the Leroy Thompson Memorial Airport at Bethany, Conn.; Casa Grande, Ariz.; Estherville, Ia.; Durango, Colo.; Farmington, N. M.; and Cairo, Ill.

FOREIGN ACTIVITIES

Venezuelan Air Mail Contract to French Firm

CARACAS (VENEZUELA) — Contract for carrying all Venezuelan air mail to Europe, Africa, and other South American Countries has been awarded to the French Compagnie Generale Aeropostale as a result of negotiations carried through by Colin Jeannel representing the company. The contract is to remain in force for 10 yr. In addition it gives the company the right to establish an interior line from Maracaibo to Bolivar, a distance of about 750 mi. This line will require extensive surveying and will probably not be opened for at least a year.

Mail from Venezuela to Europe will be carried by connection with the route to Natal, Africa, already in operation. The time required will be about eight days, whereas fifteen to eighteen days are now required by boat, and the service is somewhat irregular. M. Jeannel, after obtaining this contract, is continuing his tour of South American countries in the interests of Compagnie Générale Aeropostale.

Do.X Carries 169 on Flight

FRIEDRICHSHAFEN (GERMANY)— Designed to carry 160 passengers beside its crew, the Dornier Do X on Oct. 21 made a very noteworthy flight of an hour's duration carrying 159 passengers in addition to a crew of ten. The huge flying boat was taken off the surface of Lake Constance at 11:15 a.m., and landed at 12:07 p.m., in the meantime having been flown about 110 mi. over the lake and neighboring country at an average altitude of about 600 ft. This altitude was increased to 1,200 ft. at times. The flight was reported to have been without a hitch and complete satisfaction with its performance was expressed. The pilots were Richard Wagner, chief pilot of the Dornier company and Captain Merz of Luft Hansa.

Returns From African Survey

SHIP HARBOR LAKE, NOVA SCOTIA (CAN.) — R. A. Logan recently returned from Central Africa where for the past eighteen months he has been in command of a commercial aircraft expedition, photographing approximately 20,000 sq. mi. of Rhodesian Congo Border Concessions. The work was begun in 1927 and included other types of aeronautical operations. Mr. Logan learned to fly at the Curtiss Flying School in 1915 under the instruction of the late Tony Jannus and for several years, was manager of the Mapping Division of the Fairchild Aerial Surveys in New York City.

Mexican Line Extends Service

MEXICO CITY (MEXICO) — Transcontinental Aero Transport is operating two more lines, with San Luis Potosi, capital of the state by the same name, as base. One line runs from there to Torreon while the other route is to Guadalajara, capital of the state of Jalisco with stops at Leon, state of Guanajuato, and Arandas, Jalisco. Two round trips per day are made over both of these lines. Floyd Clevenger is chief pilot for the company of which Eduardo Meade is president.

Blériot Develops Advertising Device

PARIS (FRANCE)—Aerial advertising by means of a large fabric panel towed behind a plane has been successfully demonstrated by the Blériot company. When the machine takes off, the panel is rolled under the bottom wing in a specially designed paper packing. At the desired altitude the packing is torn away, and the panel unrolls. The towing cable is attached to a strut which holds the front side rigid, and also provides means for towing the panel in either vertical or horizontal position.

As used at present, the sign measures 165 ft. in length and 60 ft. in height and is designed for use with a towing rope about 650 ft. long. The towing rope is, of course, released above the flying field before landing, so that there will be no danger of fouling it with the airplane as the craft is set down.

Clerget Develops French Diesel Engine

PARIS (FRANCE) — M. Clerget, the pioneer aero engine designer of prewar days, has been experimenting for years on a new Diesel power unit for airplane use. Recently, the tests on the bench showed his production to be ready for actual trial. The engine, which is of the radial aircooled type developing 80-100 hp., was installed on a Morane-Saulnier A.R. monoplane, normally equipped with a 120 hp. gasoline engine.

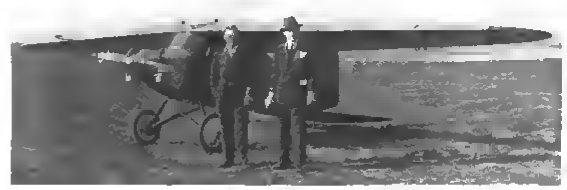
The first trial flights took place some time ago, Sergeant Millo being at the controls. They gave encouraging results and, on Sept. 28 the Director General of the Technical Services M. Caquot, went to Villacoublay flying field to witness the experiments. Two days later Sergeant Millo flew again, this time demonstrating the engine before M. Laurent Eynac the Air Minister.

The Clerget engine is to be submitted now to extensive endurance tests.

Plan Gift of Plane to Mexico

MEXICO CITY (MEXICO)—Plans are being made for the presentation to the Mexican government of one military plane by each of the 28 states in the Mexican Confederation. It is anticipated that planes of the Corsair type will be used as the squadron will be intended primarily for coast defense, on the recommendation of the Governors of the various states. Money for the planes will probably be available by Jan. 1.

Light French Cabin Monoplane Makes Four Records



USING THE EFFICIENT Mauboussin light monoplane described on page 770 of the Oct. 12 issue of AVIATION, the young and brilliant pilot Fauvel has recently annexed four world records for light planes 4th category of the F.A.I. (monoplanes weighing less than 200 kg. empty). On Sept. 5 he attained a height of 17,384 ft. Tackling next the closed circuit distance record, he covered 434 mi. during the flight his gas consumption worked out to the remarkably low figure of 6.34 qt. for 62 mi. He had in the same time established the speed record over 62 mi. with the good average of 86.8 m.p.h. On Sept. 9, he went to St. Inglevert, near Calais, to attempt the straight-line distance record which he succeeded in beating. The distance covered is 560 mi.

Foreign News Briefs

Gerd Archgelis, Bremen Germany, established an unofficial record of 37 min flying upside down in a Focke Wulf plane with 70 hp. Siemens engine.

Aeroposta Argentina has begun regular operation of a weekly air mail service between Buenos Aires and Santiago, Chile.

Aviation committees of leading British underwriters have formed the nucleus for an aviation branch of Lloyd's Register of Shipping.

S.I.S.A. will soon open a new airline between Trieste, Venice, Milan, Genoa and Marseilles. The Italian Government is providing a subsidy of 40,000,000 lira to be spread over a period of 10 yr.

The Abyssinian Air Force consists of one French pilot with the only plane which has been permitted to enter the country.

Five tons of gold valued at nearly $2,500,000, were recently carried from London to Paris in one day in Imperial Airways planes. During nine days, 40 tons of gold were carried across the Channel.

The Junkers company has obtained a contract to carry European air mail from Bagdad, where it is received in Imperial Airways planes, to Persia, and also to carry mail from Iraq to Persia.

Interior equipment, including a smoking room with bar, is being added to the Dornier DO X, which has made 30 successful flights during the past ten weeks.

Owing to unsuccessful results of test flights, regular night air mail service between Brussels and London will not be inaugurated until next month.

Bayrische Motorenwerke, Munich, Germany, licensed to manufacture Pratt & Whitney Hornet engines, has constructed a 50 hp. five-cylinder radial engine of similar design which employs a Farman type reduction gear with a ratio of 2: 1, so that the normal crankshaft speed is 2,750 r.p.m.

Revue des Forces Aériennes is the name of a new French monthly dealing with military aeronautics.

The French government has ordered a Rohrbach "Romar."

Italian "Salvator" parachutes have been adopted by the Swiss Air Force.

Air mail and passenger service between El Paso, Tex., and Mexico City via Chihuahua, Torreon and Suchiate was increased Oct. 1 from every third day to daily.

Pickwick-Latin America Airways has bought land for, an airport in Nogales, Sonora.

Gipsy Moth seaplanes are to be used for training purposes by the Portuguese Naval Air Force. The Prince of Wales has adopted a Gipsy Moth two-seater for his personal use.

The first "Lascondor," a six passenger cabin monoplane to be fitted with three "Mongoose" engines, is nearing completion in the Larkin Aircraft Supply Company's plant at Melbourne, Australia.

New airports have been opened recently by Australian Aerial Services, Ltd., at Bendigo, Victoria, Coolamon, New South Wales, and Mathoura, New South Wales.

An all-Australian Aircraft Exhibition was opened in the Exhibition Building, Melbourne Sept. 14.

Weekly aviation service by seaplane between Beirut, Syria, and Marseilles, with stops at Athens, Greece, and Naples, Italy has been started by a French company. The line has received a joint subsidy from the French and Syrian governments.

It is reported that five Italian planes are being prepared for a simultaneous transatlantic flight with New York as the ultimate objective.

Successful tests of a radio device which indicates direction, distance and characteristics of fog signals have been made in England.

Raab Katzenstein Works, Germany, are considering plans for establishing a branch factory in China.

The Peugeot company has acquired a license to build the new Junkers Diesel engine in France and French colonies.

The Mexican Good Will plane in which Col. Pablo Sidar and Lieut. Armilio Cortes were making a tour of Latin America was practically demolished when the pilots were forced to make an emergency landing near Nobol, Ecuador.

Up to Sept. 2 of this year, 16,384 passengers had been carried, 3f3,171 lb. of letters and freight transported, in a total of 1,271,498 mi. of flying on the Perth-Derby and Perth-Adelaide routes of West Australia.

Hydroplanes to be purchased in the United States will be used for running down smugglers and pirates in the Gulf of Mexico by the Mexican government.

Mexican Aviation Company is constructing a $250,000 flying field at Tampico.

Students of the School of Navigation and Civil Aviation, Vera Cruz, Mexico, have built their second glider.

About Nov. 1, Capt. Feliciano Flores of the Mexican Air Force will undertake an exploration flight from Mexico City to La Paz, capital of Lower California. It will be the first crossing of the Gulf of California by plane.

Junkers J-38 Nears Completion

DESSAU (GERMANY) — Finishing touches are being added to the Junkers J-38, which will be the world's largest land plane, seating 50 passengers. It is a monoplane with a wing span of 147.6 ft. using four 460 hp. engines. The fuselage, constructed of duralumm and corrugated iron, has two decks, one for passengers and one for freight. Flight tests will be made at Tempelhof Airport, Berlin.

Organize New Italian Line

ROME (ITALY) — Government aid to the extent of $259,225 will probably be given to the Societe Aerea Mediterranea by the Italian Ministry of Aeronautics which has been authorized by Royal Decree to take part in the formation of that company. A 10 yr. concession to operate a commercial air route between Rome, Terranova, and Cagliari, Sardinia, and the lines known as the Albanian Civil Air Lines, has also been granted. Service on these routes started in April, 1928. Conditions which the Government will impose upon the lines include fare reductions to certain classes of passengers, approved radio broadcasting equipment, and certain tax exemptions. Death, accident, and property damage insurance must also be carried by the operators.

Sealed "Gipsy" Flies 600 Hr.

STAG LANE (ENGLAND)—Completing 600 hr. of flying without an overhaul, a DH "Gipsy-Moth" plane with "Gipsy" engine was landed here recently. The engine was sealed Dec. 29, 1928, and in the subsequent eight months the plane was flown 51,000 mi. under widely varying conditions. During that time the only attention given the engine was cleaning the filters, changing spark plugs, checking valve clearances, and correcting a minor defect in one magneto.

Klemm Wins Belgian King's Cup

BRUSSELS (BELGIUM) — Results of the seventh International Light Plane Competition organized by the Aero Club of Belgium, Sept. 29, were as follows: first, Klemm plane with Salmson 40 hp. engine, 273 points, winning the King's Cup; first in category I, Caudron plane with 65 hp. Salmson engine, 229 points; second in category 1, Potez plane with 70 hp. Renault plane 195 points; third in category 1, Avro plane with 85 hp. Cirrus engine.

Captain Broad Wins Zenith Cup

PARIS (FRANCE)—Contrary to expectations, no further attempts to win the Zenith Cup were made after the flight of Captain Broad in a coupe Moth [described in AVIATION Oct. 12—Ed.] Consequently he was awarded the trophy when the contest closed Sept. 30 for his record of 112 m.p.h. for the 1,040 mi. circuit. M. Roeder, flying a Junkers "Junior" with 85 hp. Genet engine, was second with an average of 83 m.p.h.

France Backs West Indies Line

PARIS (FRANCE.)—An appropriation of about $2,000,000 for a French air mail line in the West Indies has been approved by the finance committee of the Chamber of Deputies. The proposed route is from the French West Indian islands to French Guiana and Venezuela, with a possible extension into Peru.

THE BUYER'S LOG BOOK

Westinghouse Electric Water System

A NEW automatic electric water system which should be useful for airports located some distance away from water supply, has been placed on the market by the Westinghouse Electric & Mfg. Company. This device may also be used as a booster to increase the city water pressure. It consists essentially of a tank and the necessary pumping equipment. Power is furnished by a Westinghouse type AR heavy duty motor operating a double acting reciprocating pump. The system is entirely automatic and requires no attention. The pump is started and stopped automatically as the water pressure reaches certain limiting points by means of an automatic electric pressure switch. An automatic air volume control and pressure gauge keeps the right proportion of air and water in the tank, thereby preventing it from becoming waterlogged. A circuit breaker is provided to protect the motor from overload.

Automatic water system for airports

These water systems are available in tank sizes of 42, 80 and 120 gal. with a capacity of 300 gal. per hr. and with an operating range of 20 to 40 lb. pressure.

For shallow well pumps, a crankshaft with two phosphor bronze bearings is used. The crank shaft is drop forged and is ground to fit. The method of lubrication is universal. Connecting rods and cross heads are bronze, and the piston rods are tobin bronze. The piston liners are bronze and the piston head is brass.

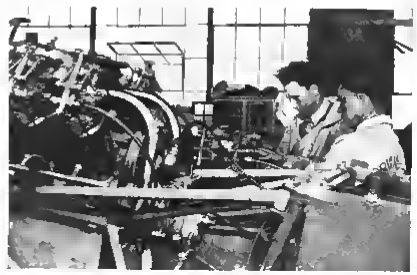
The intake and discharge parts are located high up on the side of the pump so that the pump is always primed. The entire unit can be disassembled without disturbing these connections. Valves are mounted in a vertical position making them unusually accessible.

The built-in relief valve is metal to metal and operates as a by-pass from the discharge side of the pump to the suction side. When pressure becomes too great the relief valve opens and the water recirculates through the pump. Motor armatures are individually balanced by a patented dynamic balancing machine.

These water systems are available in tank sizes of 42, 80 and 120 gal. with a capacity of 300 gal. per hr. and with an operating range of 20 to 40 lb. pressure.

Titeflex Metal Tubing

TITEFLEX is an all metal tubing with a brass inner core that is supported and protected by two layers of metal braid, and is manufactured by the Titeflex Metal Hose Co., 500 Frelinghuysen Avenue, Newark, N. J. It has been used successfully in the airplane industry for the carrying of gasoline and oil in fuel line installations for a number of years. The company furnishes according to requirements any of the standard pipe threaded fittings or any S.A.E. coupling for use with this tubing. It is recommended that this material only be used in a made up overall length with fittings attached before shipment.



Photograph showing use of "Titeflex" metal tubing in an airplane engine

Titeflex has been developed to provide a means of protection against breakage of fuel lines due to crystallization resulting from vibration.

Stanley Electric Screw Drivers

AN ADDITION to the line of Stanley electric tools has been recently announced. Two electric screw drivers Nos. 1 and 2 have been added. These tools are similar in many respects to the Stanley Electric Drills.

The No. 2 Stanley electric screw driver.

These drivers have a positive clutch in the spindle which disengages when pressures is released. No. 1 driver is capable of driving screws up to 2 inches, No. 12 size. No. 2 driver is capable of driving screws up to 3½ in. long, number 16 size, lag screws, ¼ inch x 4 inches long and bolts and nuts up to ⅜ inch.

Universal motors, ball bearings and other features are the same as in Stanley electric drills. A full line of screw driver bits can be furnished for use in these tools.

WHAT OUR *Readers* SAY

Air Race Handicapping

To the Editor:

The article on air races and handicapping, by Captain R. J. Goodman-Crouch, [in AVIATION for Aug. 24] contains quite a lot of interesting as well as valuable information concerning the handicapping of airplanes for racing purposes.

I have used, heretofore, a system which takes a lot of time but which I believe is very fair to all contestants. This was used in the National Air Races and is to have all planes in the handicap race flown around the specified course by a disinterested party and then handicap them on the actual speed they made. I have found that if properly done this may be a very interesting race and in some cases where planes were 15 or 20 miles an hour faster than others we had them actually ending in two-fifths of a second of each other.

The only objection to this method being that it takes quite a lot of time to fly the airplanes in order that they may be properly handicapped. The advantage being that it does away with a lot of technical detail and makes the handicapping plain and easily understood by the contestants. I think this, in a way, more than offsets the trouble it causes although I will make a thorough study of the handicapping method as outlined in the article and use it wherever possible.

Luke Christopher,
Secretary, Contest Committee,
National Aeronautic Association,
Washington, D. C.

* * *

Another View on Stunting

To the Editor:

I found the large majority very interesting in one of your editorial expressions in the September 7th AVIATION headed "Civilian Stunting." I seem to disagree with your viewpoint although you might have some particular instance in mind which I also would feel was bad for the general public.

It would seem to me that the ordinary man is possessed of a considerable fund of common sense which enables him to distinguish between the practical side of aviation and the sensational side. People probably attend air meets with the idea of being entertained and thrilled to some extent. Nevertheless while they are present at the air meet they are bound to absorb a great deal of confidence in the practical side of aircraft operation. I don't think it hurts the customer at all to see the terrific antics which an airplane will stand. On the contrary I think it increases the confidence in aircraft to know that the airplane has capabilities which he has no desire to utilize. As you point out in an editorial in the same issue concerning night flying on the 'Saratoga' the knowledge that safe landing can be made in darkness on the unstable deck of a ship serves to encourage the prospective passenger.

I recently happened to see a moving picture show which I am sure everybody in aviation would condemn. This picture showed an airplane performing a wild variety of crazy stunting near the ground and I am sure it left the audience with that "not for me" feeling. This sort of thing I feel is bad because the only thing the audience sees at the time is crazy stunts while at an air show the greater proportion of the flying which the audience sees is of a sound and helpful nature. At least, there is enough sound flying to impress the audience with the fact that the stunts are in the nature of play or sport carried out in holiday spirit and not intended for use in every day commercial operation.

So I feel that I can heartily agree with you that stunting is very bad when only stunting is shown but that a certain amount of stunting mixed in with a greater portion of "practical operation" flying is useful to demonstrate the reserve safety capacity. This seems to line up in my mind with the sales policy in automobiles where the salesman explains that an automobile which will function and stay on the road at 80 miles an hour is, by reason of that capacity, a safer automobile to operate under normal conditions and in panics.

I fully agree that if nothing was shown at an air meet except a few crazy stunts the audience might go home with a firm intention to stay on the ground, but under the actual conditions it seems to me that the thrilling stunts are a necessary bait to overcome the inertia of the mass of people who would otherwise fail to visit various aeronautical expositions and thereby miss seeing a great deal of confidence inspiring flying.

Lesslter C. Milburn,
Second Vice-President,
Chief Engineer,
The Glenn L. Martin Co.,
Baltimore, Md.

* * *

European Tour Report Correction

To the Editor:

In the issue of AVIATION for September 14th, 1929 and the report on the recent International Light Plane Tour of Europe, on page 562, column 2 you mention that one of the "Moths" piloted by Captain Broad actually made the fastest time round the course.

We beg to draw your attention to the fact that Mr. J. E. Carbery piloting an RK 25 machine fitted with CIRRUS "HERMES" engine returned the fastest time over the whole tour, and not Captain Broad as is mentioned in your publication.

J. Vivian Holman,
Assistant Sales Manager,
Cirrus Aero-Engines Ltd.,
London, England.

* * *

"Carrier Pigeon" and the Tour

To the Editor:

We wish to call your attention to an error which has been made on Page 738 of the October 12 issue of AVIATION in the article dealing with the Ford Tour. On Page 738 it is suggested that the withdrawal of the Curtiss Carrier Pigeon from the Ford Tour was due to the fact that no Approved Type Certificate had been issued. This is not the case, however, for the Carrier Pigeon II has been issued Approved Type Certificate No. 237, which certificate was issued on September 25 of this year. The reason for withdrawing the airplane from the tour is that it was desired to place it in actual service immediately.

T. P. Wright,
Chief Engineer,
Curtiss Aeroplane & Motor Co., Inc.

* * *

Penaud and Canard

To The Editor:

AVIATION, issue of August 17, carried an article by Albert Merrill, under the caption of "The Penaud versus the Canard Types."

First, I should like to take exception to Mr. Merrill's use of the name "Penaud" as a symbol for conventional-type airplanes, and then proceed to the more vital criticism of his comparisons and conclusions.

Mr. Merrill's authority for grouping our present-day planes under the generic term 'Penaud Type" is certainly not valid, if it is based on the assumption that Penaud's was the first airplane model to carry a tail. Penaud's work dates from 1871. France can bring forward two other sons, Le Bris and Du Temple whose planes carried tail-stabilizers as early as 1857. Germany could cite Von Drieberg 1845 and England could carry all honors in priority, with Henson 1842 and Sir George Cayley, 1810.

Since the basis of comparison in Mr. Merrill's article is just "stabilizers" and their positions on airplanes, why not call the present day standardized airplanes the "Headless" type, and the Canard, the "Tailless" type?

I shall use this choice of terms now, in trying to inspire public confidence in the tailless airplane, and, paradoxically as it may seem, I shall use Mr. Merrill's own chart of wing characteristics, and his own inadvertent admissions, towards this end.

Mr. Merrill's graph (AVIATION, August 17, page 369), shows and his words proclaim that, "within the normal flying range, L dominates over D in determining the sign and magnitude of the static pitching moment couple. It follows therefore that within this range stable static pitching moment characteristics can be made the same for both types by placing the C.G. properly and having the proper amount of decalage. In this range of angles the tailless airplane has an advantage inasmuch as its stabilizer lifts, whereas the headless airplane's stabilizer carries a down load."

Well I might "rest my case," as the lawyers say, right here, and give the pennant to the tailless airplane, because it is within the "normal flying range" that most flying will always be practiced, that is to say, *commercial* flying. But to continue, and again quoting Mr. Merrill: "If now we consider the condition to the right of the line bb we get a very different result. Here we find that the rate of change of D will dominate. It is just this that will always make the tailless type very dangerous in my opinion."

What Mr. Merrill says here is that, to the right of the line bb is the "stalling" region for *all* airplane types. And Mr. Merrill proceeds to particularize. "In the headless type the D of the stabilizer is always a righting force, like the feathers on an arrow, but in the tailless type the D is always an upsetting force because the stabilizer is in front and at those angles where D dominates over L this upsetting force is going to cause accidents." It is my contention, however, that within this stalling range, with the headless airplane, the D of the stabilizer is positively not "a righting force." If it were, involuntary nose-dives and tail-spins would be unknown! Also, in the tailless airplane the D is positively not "an upsetting force" and as a corollary, therefore, is not "going to cause accidents."

To elucidate further: Within the stalling range, what really happens is that "at angles to the right of the line bb," the headless airplane stalls as a whole, loses aerodynamic lift, gravity pulls it down at its C.G., it is no longer "flying" but merely "mushing" forward and in this condition the stabilizer becomes the medium through which an unbalanced force of air-pressure acts, over a moment-arm of relatively great length, to co-operate with gravity in upending the machine into a nose-dive followed by a tail-spin, and the Press headlines the news of another machine which "buried its nose in the ground."

On the other hand and under identical circumstances, the tailless plane would also stall, but could not upset, because its stabilizer, being in front, stalls first, loses lift and drops of its own accord, persuant to its aerodynamic characteristics considered as a wing section. Simultaneously when the tailless airplane's stabilizer reaches its stalling point, its wings proper reach their angle of maximum lift and the machine as a whole flattens its attitude down to normal flying angle, in opposition to any and all "upsetting" action and this it does automatically, without the intervention of the pilot.

Mr. Merrill's comparisons are invalid because he attempts to "reconcile the irreconcilable" to liken a tailless to a headless airplane, "both types being treated as rigid bodies in this comparison." I would point out that in actual flying neither type is a rigid body, but is capable of very flexible control by a pilot. Furthermore, that the headless type is provided with a stabilizer which is a "neutral" or non-lifting surface, whereas the tailless airplane's stabilizer is a decidedly lifting surface endowed with aerodynamic characteristics which cannot logically be related to the headless airplane's stabilizer. Also, and here is the claim which most invalidates Mr. Merrill's conclusion, such a comparison as he makes could only be tenable provided that the two types of machines in question were designed to carry their C.G. in the same relative position, under the wings proper of the machines—which no well engineered Canard airplane would do. It would on the contrary carry its C.G. well forward of the wings proper, thus co-operating with said wings proper to offset and oppose all the "upsetting" action Mr. Merrill fears.

In conclusion, let me repeat that the headless and tailless types of airplanes cannot be compared. They are inherently and diametrically opposed in their theories of design and qualities of action and I would further state that whereas the headless airplane embodies and is guilty of all the faults Mr. Merrill would ascribe to the tailless airplane, the latter embodies features which, given the one-thousandth part of the study and development already squandered on the headless airplane, would give us what the world is still yearning for, a really safe airplane!

Joseph Blondin,
Los Angeles, Calif.

* * *

Alloys in Engine Castings

To the Editor:

Regarding your article "Light Alloys in Aircraft" in the September seventh issue of Aviation, and in particular that part of the article concerned with 'Alloys for Engine Castings' the 13% silicon alloy (No 132) has been very successfully used for pistons in French air-cooled and water-cooled engines for the past five years. The final cutting operation on the lathe is done with apparent ease using a diamond pointed tool.

The same alloy is used in Breguet cast airplane wheels, and for the crankcases of several German engines notably the Maybach.

Jerome Lederer,
Dayton, Ohio.

Editorial Comment
FROM THE DAILY PRESS

Lesson of the Air Meet

The net result of the Cleveland air meet, in so far as the public mind is concerned, is an impression that flying is very dangerous. The public recalls that two men and a woman were killed in Boston while flying to the meet, another woman crashed through the roof of a factory in Cleveland, still another woman was killed flying from California to the meet, and Col. Lindbergh on several occasions treated the crowds to terrifying exhibitions of stunt flying.

All of which is very bad advertising for aviation. There is some merit in competitive meets. Much is learned from them, but the good is far outweighed by the harmful impression left in the public mind.

The meet at Cleveland was arranged to boost aviation. The Boston *Traveler* has consistently been the friend of the industry and will continue to be so. While fliers at Cleveland were supplying the world with stories of accident and death, real good was being done aviation by the intelligent operation by such companies as Curtiss and Colonial Air Transport of safe ships, amply powered, thoroughly inspected and sanely flown by competent men.

The everyday progress of wise men advances aviation. The spectacular stunts of the sensationalist retard it.

Boston Traveler.

New Volumes FOR THE SHELVES

A BOOK OF THE AEROPLANE, *By Captain Laurence J. Pritchard, Longmans, Green & Company, $3.00, 267 pages*

IT IS TO BE PRESUMED that the author of this book had at his disposal all of the vast collection of records and historical data which the Royal Aeronautical Society of Great Britain has accumulated during its long and very useful existence.

Captain Pritchard is the secretary of the Royal Aeronautical Society. He has written a book for the man on the street, and has assumed that his reader knows little or nothing about airplanes. The book is therefore very elementary in its approach to the subject and devoid of technical terms.

Unfortunately, the author set out to cover a field far too large for the contents of one book when he endeavored to tell his reader everything pertaining to an airplane from its historical development through all its present ramifications, including even the recent progress of aviation.

As might be expected, this thins the treatment of the subject out in some places until it reads not unlike a catalog. However, the reader for whom it was intended will be able to get a fine birdseye view of the subject and will find himself well repaid for the time spent upon this volume.

This historical section, though brief is fairly well done with considerable emphasis upon the Wright brothers and their experiments.

So many of our American authors apparently assume that everyone knows all about the Wright brothers that the reader is almost compelled to turn to a foreign book such as this to get a detailed picture of the Wrights' work.

The book has many illustrations, all of which are good though small in size. Most of them are well chosen.

It is to be hoped that if this second edition is so received as to warrant a third that the author will take the pains to correct some of the minor errors that have crept into his work, which it must be frankly admitted does not have the mark of scholarship which one has come to associate with British authorship.

May we also hope that we may get other books, less broad in scope and more detailed upon some of the phases of aviation from this man who has access to one of the richest collections of material upon the subject anywhere in the world?—ROLAND H. SPAULDING.

• • •

INTERNATIONAL AIRPORTS, *By Stedman S. Hanks, The Ronald Press, $5.00, 189 pages.*

IN GENERAL I liked this book. It should be of interest or use to professional airport designers and constructors, to laymen interested in some particular airport layout, to the directing personnel of all airport operating companies and of air transport lines, and to students of aerial transportation at large.

What I liked most about it was that Col. Hanks has written a book on Air Transportation and based it entirely on the idea of reporting what *has been done* at the various important air terminals and on the outstanding airlines of the world, and has apparently collected his material in person, or at least through direct correspondence. The main body of it certainly is no mere re-hash of other people's magazine articles and government reports.

The generalities he sets out in his introductory chapter are few but just, the general superiority in appearance and appointments of European airports over our own fields, and he admits this is decreasing, our own sad lack and Italy's fine development of seaplane bases, England's two way radio, Germany's air-rail tie up for packages and freight, our own night flying preeminence, and the great utility of broad concrete aprons near hangars, which aprons seem common abroad but very few and far between in this country.

The book is by no means exhaustive, but Tempelhof, Le Bourget, Croyden, Amsterdam, Rotterdam, Copenhagen and Rome are well described as are the American fields at Buffalo, Oakland and Chicago. There are chapters on passenger and freight handling in Europe, airport buildings, communications, insurance, lighting, etc., largely from the European angle. The general chapters on air transportation and 'making the airport profitable" are not quite up to the rest of the book.

The author has the usual appendix showing the International Aeronautical Convention Regulations, and the Pan-American Convention, and something from a Berlin airport company's charter. Personally, I am gradually getting a bit bored with seeing the International Convention turn up in the appendices of aeronautical textbooks. It is getting into the anathema class along with the after-dinner speakers who quote Tennyson's "Locksley Hall" or who tell the negro story about 'Terrah firmah for me sah, and the more firmah, the less terrah."—DANIEL C. SAYRE.

• • •

AVIATION, ITS COMMERCIAL AND FINANCIAL ASPECTS, *By Richard Rea Bennett, Ronald Press, New York, 1929, $3.00, 123 pages*

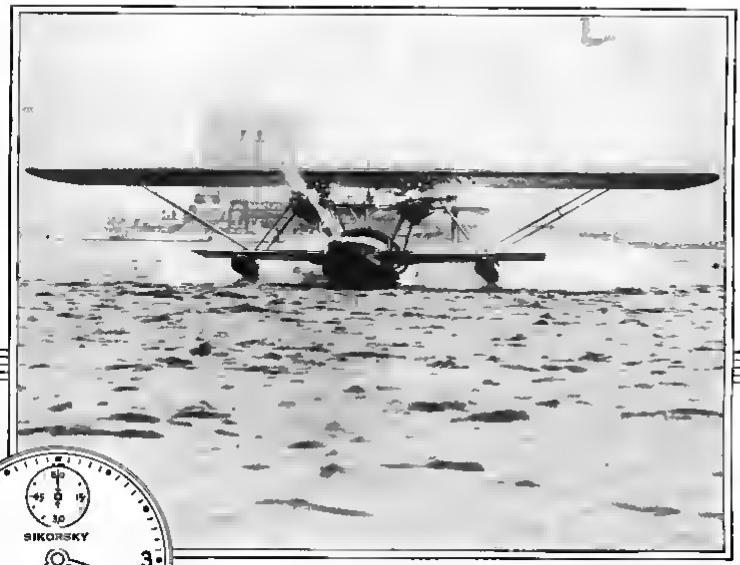
UNTIL I had read this book there was one principle of life to which I clung as to one last fixed point in an ever-changing universe. It was that in any book which someone had considered worth while publishing there was some information, something new, something still worth acquiring for myself. But there is not one statement, one statistic, one argument advanced by Mr. Bennett in this book which I or anyone else with a fair working or reading knowledge of aviation could not reproduce at a moment's notice, and our statistics wouldn't be anonymous either.

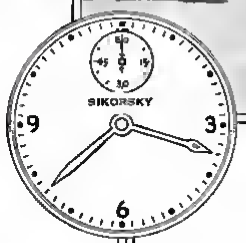
Perhaps, after all, Mr. Bennett has not intended his book for us professional aeronauts. To quote from the preface, "The purpose of this book is to outline and explain the financial and commercial problems of aviation which daily confront the layman, the banker, the investor, the economist, the educator, the lawyer, the engineer, the scientist, the college student, the business, advertising and insurance man, and the transportation and public utility engineer." The author has risked the rather complex fate of falling between fourteen stools.

In Mr. Bennett's newspaper training he has picked up a dread of leaving anything out, and indeed the chief merit of the book is that there is a generality about everything in the entire field. His main groupings are such all embracing subjects as 'The Present Status, Safety and Dependability, Financial Aspects, Manufacture of Aircraft, Air Transportation, Airports, Aids to Navigation," all in 123 pages of fairly large print and four non-committal photographs. When he does give direct statistics he must for some reason delete names. Possibly he got his information direct from the Department of Commerce, which must be anonymous for legal and political reasons. For example, references to "the subsidiary of a large automobile company" which "has delivered 51 trimotored metal planes to purchasers during 1928," and "The operator of a freight service flying with full pay load between Dearborn, Mich., and Chicago," etc., may avoid possibility of a lawsuit, but why not call a Ford a Ford, not a popular four-cylinder car which is manufactured outside Detroit by a man who collects antiques.

There is a cautionary bit about not buying all aeronautical stocks, but it is hopelessly sugar-coated with statements like, "One prominent engine builder rejected an order for 1,000 motors for 1929 because capacity operations already had been sold and an increase in plant facilities was considered imprudent for the time being."

This may be a dandy book for the layman and would make a half dozen passable articles for some part of a Sunday newspaper—maybe it has already—but there is no place for it in a series of aeronautical text books which the aeronautical public is in the habit of purchasing, especially since it is going to be out of date in about six more weeks anyway.—DANIEL C. SAYRE.



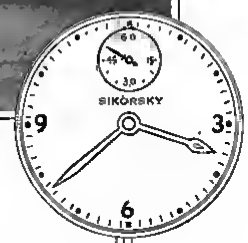


3:38 P.M. . . . A perfect Seaplane takes off.

Gun the "Wasp" engines on a Sikorsky Amphibion and an unusually short run picks her off the water. Ease back on the comfortable control wheel and her fast, easy climb cannot but stir your honest admiration. A gentleman's ship if ever there was one!

To state it even more definitely: A ship for men who know and love the water.

And yet you may want to land a dozen miles from water. Reach for that convenient landing gear control and in less than fifty seconds . . .



3:38:50 P.M. . and the Sikarsky "S-38" is an ideal land plane

The wheels slide down, moved by smooth, positive hydraulic control . . . and you have a ship completely at home under land conditions. The "S-38" is now equipped with Sikorsky designed brakes which bring her to a stop in less than 300 feet.

It is natural to think of the Sikarsky Amphibion as a ship of comfort and luxury . . . but it is interesting to be more specific. She has a ceiling, for example, of 18,000 feet, a cruising speed of 110 and a high speed of more than 125 miles an hour. She will fly . . . and maneuver . . . on either engine.

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Realizing that experience is the best teacher, the complete **AIRTECH** System provides diversified training in five distinct types of modern aircraft.

In mastering these open ships and large and small cabin planes, **AIRTECH** students gain the ability to pilot any of the aircraft, predominant in modern air commerce.

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FIRST IN THE WEST

Lindbergh Field **San Diego, California**

For the second successive year... WACO WINS THE NATIONAL AIR TOUR

The two WACO entries, piloted by John Livingston and Arthur J. Davis, ran neck-and-neck throughout the tour, finishing with scores far ahead of the other 27 contestants. Last year, also, WACO led the field.

Repeating its spectacular performance of last year, and scoring a still more impressive victory, WACO again won by a comfortable margin.

The rules of the competition for the Edsel Ford trophy are such that, by deliberate intent, the *practical* performance of an airplane is given definite valuation. The record of the two WACOs is, therefore, conclusive proof of WACO's outstanding merit . . . of WACO's rating as *the* practical airplane to own and to fly.

The Fifth National Air Tour again confirms the superior performance which has made WACO the most popular commercial aircraft in America.

THE WACO AIRPLANE COMPANY, TROY, OHIO

WACO AIRPLANES

"ASK ANY PILOT"

MODERATE PRICES AND CONVENIENT TERMS MAKE IT EASY TO OWN A WACO. COMPLETE DETAILS AT YOUR REQUEST

AND, IF YOU WISH, ANY ONE OF THE NEARLY 300 WACO DEALERS WILL ARRANGE A FLIGHT DEMONSTRATION FOR YOU

RECOGNITION

NO MORE convincing recognition could be accorded Aerol Landing Struts than their adoption as standard equipment by such manufacturers as these. It gives the oleo-pneumatic principle of absorbing landing shock definite supremacy.

The fact that 23 manufacturers have standardized (and that practically all others offer Aerol Struts as optional equipment) makes it possible for the entire operating end of the aircraft industry to enjoy a degree of landing comfort, safety and economy *that is not afforded by any other type of landing gear.*

Aerol Struts are manufactured at Cleveland by the Cleveland Pneumatic Tool Company.

Ask the Pilots Who Land On Them

AEROL *shock absorbing* STRUT

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Ryan B-5
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Travel Air Biplane
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Command Aire
Warner Motor

Bellanca CH
Wright J-6 300 Motor

Fokker Universal
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Curtiss Robin
Challenger Motor

Waco-10
Whirlwind Motor

Stearman C3-B
Wright J-5 Motor

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Moth
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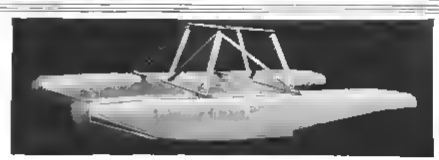
Wright J-5 300 Motor

Edo Standardized All-Metal Seaplane Floats are available in a complete series for all planes up to 5100 pounds, gross load.



For prices and particulars of Standardized Edo Float Installations, address Edo Aircraft Corp., 600 2nd St., College Point, L. I., N. Y.

Every day is moving day in industry

JUST suppose we sold you the McGraw-Hill list of 600,000 paid subscribers. We wouldn't — but just suppose we did. A year from today it would be a source of complaint to you unless you also had:

a...Our circulation staff of 100 field men who will travel nearly a million miles during 1929, checking, checking, checking.

b...The good will of thousands of subscribers who voluntarily inform us of their changing responsibilities and addresses month after month.

c...The Second Class postal privileges that automatically correct addresses when addressees do not.

What is a perfectly good industrial list today will be at least 25% defective a year from today. For example: We have checked the 1928 records of 13 of the 26 McGraw-Hill publications which have a circulation of 210,176 paid subscribers.

Were it not for these channels of checking, this list of 210,176 names would have contained on December 31, 1928, deadwood to the extent of 48,120 names. Not on account of failure to renew nor delay in remitting, but because of changing functions and addresses brought about by:

Plant expansion — *Mergers*
New projects — *Advancement*
Decentralization — *Centralization*
Out of business — *Transfer*
Out-and-out job changing
Change of residence

McGRAW-HILL PUBLICATIONS

New York Chicago Cleveland Detroit Philadelphia St. Louis
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W-14

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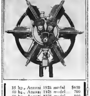

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EXPERT propeller finisher, lipper and painter wanted Steady work for the right man State experience and salary expected in first letter Karl Koen Propeller Co Sioux City Iowa

POSITIONS VACANT

WANTED—Technical graduates for airplane stress analysis P 289 Aviation, 10th Ave. at 36th St New York

WANTED—Pilot to fly new Wright Whirlwind powered New Standard on salary and commission basis by one of the most successful operators in the country Advance agent parachute jumper and mechanic already provided for P-300, Aviation Tenth Ave at 36th St New York

POSITIONS WANTED

AIRPLANE engineer with technical education and ten years practical experience in airplane design and manufacture wishes executive connection with newly forming organization of repute PW 297 Aviation Tenth Ave at 36th St New York.

AVIATION mechanics apprentice wants job Universal school graduate and several years mechanical experience Available Nov 1st Age 24 Write Clarence McGarvey Capitol Hill Station Oklahoma City Okla

TRANSPORT pilot desires position flying Now employed PW-306 Aviation Tenth Ave at 36th St New York.

TRANSPORT pilot with 1,400 hours, and 8 years experience in military and commercial flying desires position Single willing to go anywhere in U S or foreign countries References furnished Stephen Darius 3239 S Halsted St Chicago Ill

YOUNG man 35 years old wants position in aviation field Have had 12 years experience as automobile mechanic but will do anything to help get mechanic's license Kenneth Bristol Brikertown Mass

POSITIONS WANTED

LIMITED commercial pilot Emery Riddle graduate with two years mechanical experience wishes position with chance to build up flying time best of reference as to character and ability Joseph Drouden, Plainfield Ill Route 3

LIMITED commercial pilot—graduate Curtiss Flying Service Department Commerce approved advanced school Grosse Ile Mich Desires position as pilot or in airport operations management Several years experience as transportation operations executive PW-301 Aviation 520 N Michigan Ave., Chicago Ill

LIMITED commercial—300 hours new flying Good references go anywhere Canada Mexico Reasonable salary Age 24 PW 296 Aviation 520 N Michigan Ave. Chicago Ill

L C PILOT age 26, 2 years college, Curtiss training cross-country and cabin time reliable good reference go anywhere Fly for living expenses PW 287 Aviation, 10th Ave at 36th St New York

POSITION wanted by limited commercial pilot Married will go anywhere References furnished Address Scott Brown Apple Creek, Ohio

TRANSPORT pilot, four and one half years experience open ships 1,000 hours good references Also airplane and engine mechanic's license and F A I Understand design and drafting Single sober and steady can go anywhere Now own J-5 Waco Desire permanent responsible position with chance for advancement David B Read 220 Algoma Blvd Oshkosh Wis

TRANSPORT pilot age 25 Sales experience Investigate PW-303 Aviation 520 N Michigan Ave Chicago Ill

TRANSPORT pilot with 475 hours 125 hours on seaplanes wishes position with reliable party or concern Will consider anything but barnstorming Box 527 La Crosse Wis

TRANSPORT pilot 300 hours barnstorming cross country instruction, sales experience now employed desires change PW 302 Aviation 520 N Michigan Ave Chicago Ill

TRANSPORT pilot 1,500 hours Desires immediate connection with operating company or private party Experience on both open and closed jobs References furnished What have you to offer? Lawrence E Rogers Belleville Michigar

POSITIONS WANTED

TRANSPORT pilot, army trained 700 hours open and closed planes instruction and cross-country passenger work can fly any type ship general school lecturer sales and executive ability best references desires steady connection that has promise of advancement Now flying available on short notice Barry L Bitterman 807 Bebeser St Reading Pa

SALESMEN WANTED

Fortune in Airplane Sales

Under this plan a salesman should sell at least one Eaglerock a month—a net monthly income for him of from $1,000 to $1,500 Our two weeks free sales training course makes you ready to get the money We equip salesmen who qualify with a free demonstrator Eaglerock You can offer buyers an easy plan of time purchase Write for details Alexander Aircraft Co., Dept 31 Colorado Springs Colo

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Airport For Sale, 160 Acres Hangars, etc Best town in southwest Three new production biplanes need two cabin monoplanes Owner not able to finance Will sacrifice BO-292 Aviation 520 N Michigan Ave Chicago Ill

MISCELLANEOUS

ATTENTION Aviators Valve guides installed on OX cylinders $1.50 per guide; resonable valve seats installed, $2.00 descriptive literature upon request all work guaranteed. Illinois Flying Co New location, 4 West 4th St., Sterling Ill.

REBUILD your OX5 with removable graphite guides inserted seats and oversize valve action pins OX5 and Hisso parts Write for circular Beckman Machine Works 4020 West Lake Street Chicago, Illinois

BUILD and fly your own "Flying Flivver" Blueprints $5 Ford motor conversion blueprints $4 Small motors propellers hubs turnbuckles etc for iceboats snowsleds and light planes Propellers $7 to $25 hubs $5 and and $8 Latest circulars 10c Storms Aviation Co Spartanburg S C

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